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UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

October 8, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	
if paid before Oct. 5, 1985	$ 125.00
if paid on or after Oct. 7, 1985	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	
if paid before Oct. 5, 1985	500.00
if paid on or after Oct. 7, 1985	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Oct. 12, 1985	680.00
if paid on or after Oct. 15, 1985	750.00
International fees	
Basic fee (first 30 pages):	
if paid before Oct. 29, 1985	230.00
if paid on or after Oct. 29, 1985	280.00
Basic Supplemental fee (for each page over 30):	
if paid before Oct. 29, 1985	4.00
if paid on or after Oct. 29, 1985	6.00
Designation fee (for the first 10 national or regional offices):	
if paid before Oct. 29, 1985	55.00
if paid on or after Oct. 29, 1985	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Aug. 28, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on October 5, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,352,211 through 4,353,132
Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20(k)and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the

indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,309,657, Re. S.N. 561,295, Filed Dec. 14, 1984, Cl. 324/158R, APPARATUS FOR ANALYZING SEMICONDUCTOR MEMORIES, James A. Lockhart, Jr., et al., Owner of Record: *Burroughs Corp., San Diego, Calif.,* Attorney or Agent: Charles J. Fassbender, et al., Ex. Gp.: 265

4,383,853, Re. S.N. 735,478, Filed May 17, 1985, Cl. 75/122.7, CORROSION-RESISTANT FE-CR-URANIUM PELLET AND METHOD, Carl A. Zapffe, Owner of Record: *William J. McCollough, Brainerd, Minn.,* Attorney or Agent: Arthur G. Connolly, et al., Ex. Gp.: 223

4,399,833, Re. S.N. 767,525, Filed Aug. 19, 1985, Cl. 137/315, VALVE ASSEMBLY, Edward G. Holtgraver, Owner of Record: *Keystone International, Inc., Houston, Tex.,* Attorney or Agent: James Bushman, et al., Ex. Gp.: 347

4,400,304, Re. S.N. 767,943, Filed Aug. 21, 1985, Cl. 502/159, CATALYST PELLETS WITH RESIN BINDER FOR DECOMPOSITION OF HYPOCHLORITE, Roger T. Clark, et al., Owner of Record: *Inventors,* Attorney or Agent: E. Leigh Hunt, Ex. Gp.: 116

4,465,263, Re. S.N. 768,679, Filed Aug. 23, 1985, Cl. 256/52, COMPOSITE METAL AND PLASTIC FENCE, Edward S. Robbins, Jr., Owner of Record: *Inventor,* Attorney or Agent: Paul N. Kokulis, et al., Ex. Gp.: 351

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,226,575, Reexam. No. 90/000,840, Requested: Aug. 20, 1985, Cl. 417/423A, WET PICK-UP VACUUM UNIT, Robert L. Hyatt, et al., Owner of Record: *Ametek, Inc., Kent, Ohio,* Attorney or Agent: Ray L. Weber, Ex. Gp.: 343, Requester: Ametek, Inc., Akron, Ohio

4,354,040, Reexam. No. 90/000,850, Requested: Sept. 3, 1985, Cl. 564/67, PROCESS FOR SYNTHESIZING UREA, Shigeru Inoue, et al., Owner of Record: *Miysui Toatsu Chemicals, Inc., Toyo Engineering Corp., Both of Tokyo, Japan,* Attorney or Agent: Fisher, Christen, et al., Ex. Gp.: 124, Requester: Cushman, Darby, et al., Washington, D.C.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Nov. 8, 1985:

Billups, Richard C., 101 E. Oak St., Bldg. E-1, Oakland, N.J. 08436

Collins, Daniel W., 214 Rue Flambeau, South Bend, Ind. 46615

Daniel, Mark R., 1653 Kings Dr., #217, Bartlesville, Okla. 74006

Goodhart, Barbara A., 1736 N. Rhodes St., #287, Arlington, Va. 22201

Jarzyna, Andrew K., Moffat & Co., P.O. Box 2088, Sta. D, Ottawa, Ont., Canada K1P 5W3

Molnar, John B., 4632 Rambo La., Toledo, Ohio 43623

Morgan, Bruce E., Gowling & Henderson, 160 Elgin St., Ottawa, Ont., Canada K1N 853

Pitrelli, John F., 6133 Covered Bridge Rd., Burke, Va. 22015

Randolph, John D., 4900 Nantucket Rd., College Park, Md. 20740

Sherman, Robert, 3611 Napoli La., #8, Middleton, Wis. 53562

Sept. 12, 1985.

CAMERON WEIFFENBACH,
Director Office of Enrollment and Discipline.

U.S. GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing National Technical Information Service U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-725,720. MEMBRANE PROCESS FOR SEPARATION OF ORGANIC ACIDS FROM KRAFT BLACK LIQUORS.

SN 6-732,320. APPARATUS TO IMPROVE THE OPERATION OF A CONTINUOUSLY MOVING HARVESTER FOR TREE CROPS.

SN 6-757,396. A QUARANTINE SYSTEM FOR PAPAYA.

DEPARTMENT OF COMMERCE

SN 6-751,118. ACOUSTIC SCINTILLATION LIQUID FLOW MEASUREMENT.

SN 6-762,740. HUMIDITY SENSING AND MEASUREMENT EMPLOYING HALOGENATED ORGANIC POLYMER MEMBRANES.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-237,496 (4,528,196). CHELATING AGENTS FOR THE TREATMENT OF IRON OVERLOAD.

SN 6-330,959 (4,522,918). PROCESS FOR PRODUCING MONOCLONAL ANTIBODIES REACTIVE WITH HUMAN BREAST CANCER.

SN 6-461,954 (4,527,550). HELICAL COIL FOR DIATHERMY APPARATUS.
SN 6-475,215 (4,532,039). MULTI-LAYER COIL ASSEMBLY COAXIALLY MOUNTED AROUND THE ROTARY AXIS FOR PREPARATORY COUNTERCURRENT CHROMATOGRAPHY.
SN 6-601,314 (4,533,675). CARBAMATES OF COLCHICINE FOR TREATMENT OF GOUT.
SN 6-707,400. MONOCLONAL ANTIBODIES REACTIVE WITH HUMAN BREAST CANCER.
SN 6-724,033. METHOD AND APPARATUS FOR SEQUENTIAL FRACTIONATION.
SN 6-748,207. COLD PLATE FOR LABORATORY USE.
SN 6-759,677. MEDICAL APPLICATIONS OF FUNCTIONALIZED CONGENERS OF ADENOSINE RECEPTOR DRUGS.
SN 6-769,074. VACCINE AGAINST ROTAVIRUS DISEASES.

DEPARTMENT OF THE AIR FORCE

SN 6-329,557 (4,513,428). SIMULTANEOUS DETECTION OF TIME COINCIDENT SIGNALS IN AN ADAPTIVE DOPPLER TRACKER.
SN 6-418,917 (4,510,846). PNEUMATIC ACTUATOR DEVICE.
SN 6-504,353 (4,513,422). CO_2 LASER STABILIZATION AND SWITCHING.
SN 6-525,755 (4,511,216). HIGH POWER LASER DUMP.
SN 6-582,514 (4,511,105). COMPARTMENTED, FILAMENT WOUND, ONE-PIECE AIRCRAFT FUEL TANKS.
SN 6-591,715. GAS GENERATOR FUEL FLOW THROTTLE CONTROL SYSTEM.
SN 6-617,668. PHASE LOCK ACQUISITION SYSTEM.
SN 6-630,148. LIGHTWEIGHT CRYOGENIC TANK WITH POSITIVE EXPULSION.
SN 6-663,015. TECHNIQUE OF ASSEMBLING STRUCTURES USING VAPOR PHASE SOLDERING.
SN 6-708,909. MULTI-ROW CONNECTOR WITH GROUND PLANE BOARD.
SN 6-719,792. APPARATUS FOR LOCATING PASSIVE INTERMODULATION INTERFERENCE SOURCES.
SN 6-731,223. INTERDIGITAL SCHOTTKY BARRIER CAPACITOR APPARATUS.
SN 6-746,617. TERMINATION LOAD CARRYING DEVICE.
SN 6-749,333. SUBMERGED RAM AIR INLETS FOR ECM PODS.
SN 6-749,335. CAPTIVE VOLUME DEVICE AS A SAFE LIFE MONITOR.
SN 6-749,368. MODULATION DOPED GaAs/AlGaAs FIELD EFFECT TRANSISTOR.
SN 6-751,393. GUIDED TREPHINE SAMPLES FOR SKELETAL BONE STUDIES.
SN 6-751,399. HEAT PIPE WICK.
SN 6-751,400. ONE-STEP LOADING ADAPTER.
SN 6-752,767. TRANSIENT TEST OF SUSPENSION ELECTRONICS FOR GYROSCOPE.

DEPARTMENT OF THE ARMY

SN 6-542,635 (4,532,625). COMMUNICATIONS NETWORK STATUS INFORMATION SYSTEM.
SN 6-657,438. ELECTROLYTIC PRESSURE TRANSDUCTION SYSTEM.
SN 6-660,778. DERMAL SUBSTANCE COLLECTION DEVICE.
SN 6-692,955. COMPACT BRAKE STRUCTURE.
SN 6-741,940. CONTROL FOR DOT MATRIX PRINTERS OPERATING IN HARSH ENVIRONMENTS.
SN 6-749,597. CATHODE INCLUDING A NON FLUORINATED LINEAR CHAIN POLYMER AS THE BINDER, METHOD OF MAKING THE CATHODE, AND LITHIUM ELECTROCHEMICAL CELL CONTAINING THE CATHODE.
SN 6-751,339. ROUTING METHOD IN COMPUTER AIDED CUSTOMIZATION OF A TWO LEVEL AUTOMATED UNIVERSAL ARRAY.
SN 6-758,919. PULSED DIGITAL MULTIPLEX LASER GENERATOR.

TENNESSEE VALLEY AUTHORITY

SN 6-616,879. PRODUCTION OF ACID-TYPE FERTILIZER SOLUTIONS.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: General Electric Co., Motor Business Group, 1635 Broadway, P.O. Box 2204, Forty Wayne, Ind. 46801-2204, Attention: Patent Counsel.

4,281,706. METHOD OF MAKING HELICAL METALLIC RIBBON FOR CONTINUOUS EDGE WINDING APPLICATIONS.
4,341,845. HELICAL METALLIC RIBBON FOR CONTINUOUS EDGE WINDING APPLICATIONS.
4,415,856. ROTATABLE MAGNETIC FIELD-SENSING SOLID-STATE SWITCH APPARATUS.
4,425,521. MAGNETIC SLOT WEDGE WITH LOW AVERAGE PERMEABILITY AND HIGH MECHANICAL STRENGTH.
4,506,181. PERMANENT MAGNET ROTOR WITH COMPLETE AMORTISSEUR.
4,525,925. METHOD OF MAKING PERMANENT MAGNET ROTOR.

4,427,016. COMBINATION ASH-TRAY. *Ralph H. Orter,* P.O. Box 2074, Prescott, Ariz. 86302. Phone (602) 445-6298.

4,532,911. HEAT CONTROLLING COOKER. *Ralph H. Orter,* P.O. Box 2074, Prescott, Ariz. 86302. Phone (602) 445-6298.

4,329,977. ROTATABLE COOKER. *Ralph H. Orter,* P.O. Box 2074, Prescott, Ariz. 86302. Phone (602) 445-6298.

4,509,899. TRAVERSING BLADE-ROTARY PROPELLER. *Larry Frederick,* P.O. Box 794 SLU, Hammond, La. 70402.

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Rm. 218, Schenectady, N.Y. 12345.

4,283,822.
4,409,787.
4,531,535.

4,477,414. EVAPORATIVE CONTAINER. *Browdy and Neimark,* 419 Seventh St., N.W., Washington, D.C. 20004. Phone (202) 628-5197.

3,838,706. CONDUIT CLOSURE. *Edwin E. Greigg, Esq.,* Suite 100, 1201 S. Eads St., Arlington, Va. 22202. Phone (703) 892-0300.

4,215,716. 1-WAY CONDUIT CLOSURE. *Edwin E. Greigg, Esq.,* Suite 100, 1201 S. Eads St., Arlington, Va. 22202. Phone (703) 892-0300.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 8, 1985

PP. 5,402	4,490,249	4,512,888	4,520,791
Re. 31,703	4,490,369	4,513,078	4,520,856
Re. 31,869	4,490,450	4,513,103	4,521,002
Re. 31,907	4,490,518	4,513,142	4,521,020
D. 277,063	4,490,674	4,513,152	4,521,040
D. 279,314	4,491,488	4,513,304	4,521,333
3,899,165	4,491,548	4,513,459	4,521,461
4,085,399	4,492,288	4,513,717	4,521,687
4,187,223	4,492,516	4,513,943	4,522,049
4,216,533	4,493,798	4,513,997	4,522,391
4,251,628	4,494,604	4,514,106	4,522,430
4,268,915	4,494,768	4,514,190	4,522,733
4,324,904	4,494,775	4,514,223	4,522,846
4,340,751	4,494,848	4,514,340	4,522,943
4,389,933	4,495,080	4,514,436	4,523,106
4,390,527	4,495,102	4,514,501	4,523,189
4,392,156	4,495,586	4,514,671	4,523,198
4,396,139	4,495,600	4,514,854	4,523,206
4,403,873	4,496,857	4,514,872	4,523,324
4,408,952	4,497,787	4,514,905	4,523,672
4,417,008	4,498,522	4,514,990	4,524,151
4,423,464	4,499,499	4,515,174	4,524,203
4,423,621	4,500,472	4,515,185	4,524,414
4,424,115	4,500,576	4,515,274	4,524,723
4,426,530	4,501,599	4,515,506	4,524,829
4,427,691	4,501,773	4,515,521	4,524,852
4,428,736	4,501,776	4,515,597	4,524,862
4,433,192	4,502,080	4,515,640	4,525,011
4,434,198	4,502,141	4,515,678	4,525,395
4,439,062	4,502,359	4,515,689	4,525,663
4,442,090	4,502,637	4,515,801	4,525,771
4,445,171	4,502,860	4,515,944	4,526,238
4,446,202	4,502,971	4,516,124	4,526,262
4,459,962	4,503,464	4,516,173	4,526,263
4,463,265	4,504,413	4,516,211	4,526,283
4,463,868	4,505,062	4,516,307	4,526,295
4,470,116	4,505,233	4,516,387	4,526,491
4,470,204	4,505,420	4,516,752	4,526,563
4,470,847	4,505,508	4,516,937	4,526,678
4,471,295	4,505,834	4,516,984	4,526,772
4,471,482	4,505,841	4,517,313	4,526,910
4,473,178	4,506,012	4,517,897	4,526,925
4,474,807	4,506,192	4,517,934	4,526,927
4,476,184	4,506,315	4,518,014	4,526,944
4,476,744	4,507,186	4,518,166	4,527,124
4,477,603	4,507,230	4,518,235	4,527,366
4,479,032	4,507,318	4,518,365	4,527,802
4,479,446	4,508,023	4,518,669	4,527,970
4,480,305	4,508,234	4,518,691	4,528,030
4,480,632	4,508,487	4,518,707	4,528,060
4,480,947	4,509,016	4,518,764	4,528,375
4,480,959	4,509,426	4,518,873	4,528,594
4,481,244	4,509,793	4,519,064	4,528,597
4,481,353	4,509,957	4,519,109	4,528,713
4,482,749	4,510,166	4,519,353	4,529,421
4,482,918	4,510,529	4,519,453	4,529,517
4,483,412	4,510,565	4,519,486	4,530,191
4,487,824	4,510,617	4,519,504	4,530,675
4,487,845	4,511,792	4,519,632	4,530,978
4,488,898	4,511,890	4,519,922	4,531,915
4,488,933	4,512,534	4,520,198	4,532,021
4,489,069	4,512,558	4,520,451	4,532,526
4,489,574	4,512,698	4,520,463	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 31, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-26-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-27-82
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	11-29-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	2-22-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-16-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,395,406 to 3,399,405, inclusive

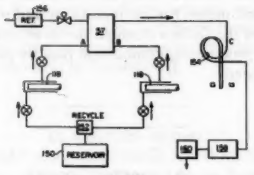
Plant Patents ..... Numbers 2,825 to 2,829 inclusive

REEXAMINATIONS

OCTOBER 8, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,855,129 (395th)
PUMPING APPARATUS
Louis Abrahams, Worcester; Burleigh M. Hutchins, Jr., and James L. Waters, both of Framingham, all of Mass., assignors to Waters Associates, Inc., Framingham, Mass.
Reexamination Request No. 90/000,681, Dec. 5, 1984.
Reexamination Certificate for Patent No. 3,855,129, issued Dec. 17, 1974, Ser. No. 232,128, Mar. 6, 1972.
Int. Cl.[4] B01D *15/08;* **G01N** *31/08*
U.S. Cl. 210—198.2



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–3, 20–27, 30** and **31** are cancelled.

Claims **4, 9** and **28** are determined to be patentable as amended.

Claims **5–8, 10–19** and **29**, dependent on an amended claim, are determined to be patentable.

4. [A system as defined in claim **1**] *In a chromatography system of the type comprising (A) a liquid delivery system comprising a pump and discharge port for supplying liquid under pressure to (B) a compartment containing a stationary phase forming means to interact with said liquid phase to effect a separation thereof during its passage through said compartment, and (C) means to collect the liquid phase leaving the compartment, the improvement wherein said liquid delivery system comprises*

1. interposed between said pump and said compartment, a liquid pressure-sensing means, and

2. motor control means operably communicating between said pressure-sensing means and a motor drive means for said pump, said motor control means forming means to control the flow-output of said pump by controlling said motor in response to the pressure sensed by said pressure-sensing means,

wherein said motor control means comprises additional control means to modify motor output in response to pressure, said additional control means forming means to compensate for compression of said liquid being pumped, and to maintain a substantially constant input of liquid into said column despite changes in compression of said liquid with varying pressure.

B1 3,952,112 (396th)
METHOD FOR TREATING DRIED FRUITS TO IMPROVE SOFTNESS RETENTION CHARACTERISTICS
Charles V. Fulger, and Daryl R. Schaller, both of Battle Creek, Mich., assignors to Kellogg Company, Battle Creek, Mich.
Reexamination Request No. 90/000,577, Jun. 15, 1984.
Reexamination Certificate for Patent No. 3,952,112, issued Apr. 20, 1976, Ser. No. 378,123, Jul. 11, 1973.
Int. Cl.[4] A23B *7/08, 7/14*
U.S. Cl. 426—321

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **8** and **10** are cancelled.

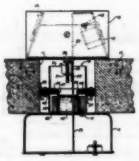
Claims **1, 12, 16, 20** and **23** are determined to be patentable as amended.

Claims **2–7, 9, 11, 13–15, 17–19, 21 & 22**, dependent on an amended claim, are determined to be patentable.

New claims **24–27** are added and determined to be patentable.

1. Method for improving softness retention characteristics of dried fruits *by treatment with a humectant, said method* comprising the steps of first immersing the fruit in an edible liquid *and pretreating the fruit in a manner and* for a period of time *in said liquid* to remove surface air bubbles therefrom, [and] then treating the fruit with a water soluble edible humectant *having a concentration greater than 50%* until the humectant content [of] *absorbed by* the fruits is in excess of 4%, *removing the fruit from the humectant and drying the fruit to a moisure level of from about 12% to about 20%.*

B1 3,995,102 (397th)
INSERT DEVICE FOR CABLES
John E. Kohaut, West Orange, N.J., assignor to Raceway Components, Inc., Nutley, N.J.
Reexamination Request No. 90/000,635, Sep. 21, 1984.
Reexamination Certificate for Patent No. 3,995,102, issued Nov. 30, 1976, Ser. No. 436,500, Jan. 25, 1974.
Int. Cl.[4] H02G *3/22;* **A62C** *3/16*
U.S. Cl. 174—48



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–16** is confirmed.

1. An insert device to be positioned in a structural opening, said opening having spaced apart ends, for connection of cables from a cable source, through the insert device and to a

service head positioned across an end of the structural opening, said insert device comprising:

a. an insert housing proportioned to be positioned in said structural opening;

b. said housing comprising a plurality of sections;

c. fire retarding means positioned intermediate said housing sections and separating the same;

d. means connecting said housing sections and positioning said fire retarding means intermediate and separating the sections;

e. said fire retarding means foaming on occurrence of excess heat or fire, to expand and seal said housing sections in the structural opening.

B1 4,198,351 (398th)

FORMALDEHYDE PRODUCTION PROCESS

Anthony J. Branecky, Kingsville, and David W. Harris, Corpus Christi, both of Tex., assignors to Celanese Corporation, New York, N.Y.

Reexamination Request No. 90/000,092, Oct. 19, 1981.
Reexamination Certificate for Patent No. 4,198,351, issued Apr. 15, 1980, Ser. No. 787,739, Apr. 15, 1977.
Int. Cl.⁴ C07C *45/29*
U.S. Cl. 568—473

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–20** are cancelled.

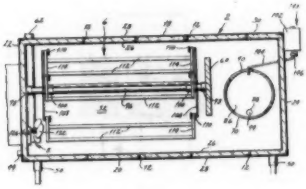
[**1**. In a vapor phase process for the production of formaldehyde wherein a mixture comprising methanol and air are contacted with a silver catalyst to produce a formaldehyde-containing product, the improvement which comprises incorporating a small amount of a halogen-containing compound, in the vapor phase, into the mixture comprising methanol and air which is contacted with the said silver catalyst, the amount of said halogen-containing compound being an amount which will increase the selectivity of the reaction to formaldehyde but which will not cause loss of reaction.]

B1 4,300,523 (399th)

BARBECUE OVEN

Berthal B. Robertson, and Michael L. Robertson, both of Marion, Ill., assignors to B. B. Robertson Co., Marion, Ill.

Reexamination Request No. 90/000,638, Sep. 24, 1984.
Reexamination Certificate for Patent No. 4,300,523, issued Nov. 17, 1981, Ser. No. 34,251, Apr. 30, 1979.
Int. Cl.⁴ F24C *15/16*
U.S. Cl. 126—21 A



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–23** is confirmed.

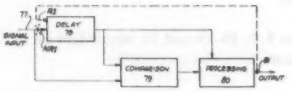
1. An oven that is particularly suited for preparing barbecued foods, said oven comprising: a housing including a plurality of walls, among them end walls, which enclose an oven chamber and a partition wall within the oven chamber, at least one of the walls having an opening through which food can be introduced into the oven chamber; a tubular firebox having spaced apart ends with one of the ends being closed by an end wall, the firebox having a tube extended from it with the tube having a cross-sectional area substantially smaller than the cross-sectional area of the firebox itself, the firebox being mounted on at least one of the walls and extended into the oven chamber from that wall so that it is for the most part spaced from the oven walls and exposed on its top, bottom, and sides to the oven chamber but has its tube extended to one of the oven walls, the firebox having apertures that open into the oven chamber to permit products of combustion to escape into the oven chamber; a door closing the other end of the firebox and being accessible from the exterior of the housing so that wood may be introduced into the firebox; a gas burner mounted on the housing and being directed into the tube on the firebox for producing a flame that is capable of entering the interior of the firebox for igniting wood in the firebox and for supplying supplemental heat to the oven chamber; means for supporting food in the oven chamber, said means being supported on one of the housing end walls and also on the partition wall; and means for circulating air and products of combustion from the firebox through the oven chamber such that the air and products of combustion pass by the firebox where they are heated.

B1 4,305,091 (400th)

ELECTRONIC NOISE REDUCING APPARATUS AND METHOD

J. Carl Cooper, 1101 Continentals Way #109, Belmont, Calif. 94002

Reexamination Request Nos. 90/000,504, Feb. 15, 1984 and 90/000,674, Dec. 3, 1984.
Reexamination Certificate for Patent No. 4,305,091, issued Dec. 8, 1981, Ser. No. 30,288, Apr. 16, 1979.
Continuation-in-part of Ser. No. 763,904, Jan. 31, 1977, abandoned.
Int. Cl.⁴ H04N *9/535, 5/21;* **H04B** *15/00*
U.S. Cl. 358—36



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–30** is confirmed.

1. Apparatus for reducing noise on an input electronic signal, including in combination, delay means for delaying said input electronic signal to produce a delayed input signal, comparison means responsive to said input electronic signal and said delayed input signal which has the same bandwidth as said input electronic signal which comparison means may always determine if the difference between said signals is greater than a reference and processing means responsive to said comparison means and said delayed input signal to generate an output signal which is either an average of said input and delayed signals when said difference is less than said reference or said delayed signal otherwise, as determined by said comparison means.

B1 4,347,360 (401st)

RING OPEN NUCLEOSIDE ANALOGUES

Kelvin K. Ogilvie, Candiac, Canada, assignor to ens BIO LOGICALS Inc., Toronto, Canada

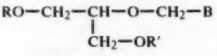
Reexamination Request No. 90/000,625, Sep. 12, 1984.
Reexamination Certificate for Patent No. 4,347,360, issued Aug. 31, 1982, Ser. No. 187,631, Sep. 16, 1980.
Int. Cl.[4] C07D *473/18, 473/34*
U.S. Cl. 544—276

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–6** is confirmed.

Claims **1–4** are cancelled.

[1. Compounds of the general formula:



wherein R and R′ are independently selected from hydrogen, and lower alkyl-substituted silyl, and B represents an unsubstituted adenine or guanine group linked to the side group shown in formula (I) above at its 9-position.**]**

B1 4,401,020 (402nd)

VEGETABLE BANDING APPARATUS

Robert A. Brux, Salinas, Calif., assignor to Seaco Industries, Salinas, Calif.

Reexamination Request No. 90/000,603, Aug. 6, 1984.
Reexamination Certificate for Patent No. 4,401,020, issued Aug. 30, 1983, Ser. No. 331,153, Dec. 16, 1981.
Filed Aug. 6, 1984, Ser. No. 331,153
Int. Cl.[4] B65B *13/30*
U.S. Cl. 100—6

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

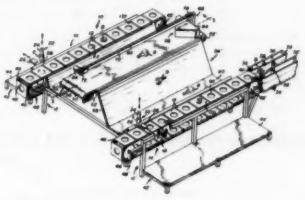
Claims **2–7**, **13**, and **22–34** are cancelled.

Claims **1**, **8–10**, **14**, **15**, and **21** are determined to be patentable as amended.

Claims **11**, **12**, and **16–20**, dependent on an amended claim, are determined to be patentable.

New claims **35** and **36** are added and determined to be patentable.

1. Vegetable banding apparatus **[**, comprising, in combination: (a)**]** *including* a supporting frame; **[**(b)**]** conveyor means including a carrier conveyor moveably supported on said frame for receiving bundles to be banded, said carrier conveyor including a plurality of segments articulated to one



another; **[**(c)**]** expander means associated with said segments of said carrier conveyor for expanding and retracting elastic bands; and **[**(d)**]** actuator means connected to said expander means **[**.**]** *wherein the improvement in said vegetable banding apparatus comprises:*

said conveyor means further including an endless belt conveyor forming a continuous surface for receiving bundles to be banded and arranged to extend substantially parallel to and co-extensive with said carrier conveyor, said belt conveyor being arranged at a higher elevation than said carrier conveyor, apron means arranged between said belt conveyor and said carrier conveyor for transferring bundles from said belt conveyor to a point adjacent said carrier conveyor, and diverter means associated with said belt conveyor for directing bundles to be banded from said belt conveyor and onto said apron means.

REISSUES

OCTOBER 8, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

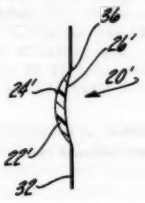
Re. 31,998
POSTERIOR CHAMBER LENS IMPLANT

William D. Myers, 5855 Wingcroft Ct., Birmingham, Mich. 48010

Original No. 4,412,359, dated Nov. 1, 1983, Ser. No. 371,541, Apr. 26, 1982. Application for reissue Mar. 9, 1984, Ser. No. 587,955

Int. Cl.⁴ A61F *1/16, 1/24*

U.S. Cl. 623–6 **2 Claims**



2. A posterior chamber lens implant for a human eye for use after extracapsular surgery in which a posterior capsule is left substantially intact, said lens implant comprising:

a substantially circular optic having a front surface, a rear surface and a substantially circular and continuous outer rear edge, said front surface being a continuous convex surface and said rear surface being a continuous concavely curved surface extending between said outer rear edge,

means for securing said optic to the eye within the posterior chamber so that said outer rear edge abuts against the posterior capsule and so that the rear concavely curved surface of said optic is spaced from the posterior capsule by a distance sufficient to safely allow a subsequent laser posterior capsulotomy,

wherein said optic is constructed of a material so that, with said optic implanted within the posterior chamber, said optic maintains a rigid shape following implantation.

Re. 31,999
ADJUSTABLE LINK-TYPE INSERTION COMPLIANCE DEVICE

Jack Rebman, Cary, N.C., assignor to Lord Corporation, Erie, Pa.

Original No. 4,327,496, dated May 4, 1982, Ser. No. 200,688, Oct. 27, 1980. Application for reissue Apr. 27, 1984, Ser. No. 604,685

Int. Cl.⁴ G01B *5/25*

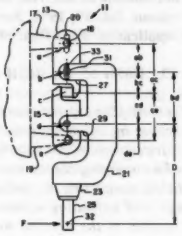
U.S. Cl. 33—185 R **22 Claims**

17. A remote center compliance device for use with an assembly machine or the like, comprising:

a linkage assembly including a plurality of innerconnected and relatively movable link elements each normally extending in substantially parallel relationship to an elongate axis of the device;

first and second ones of said link elements being pivotally connected to said machine and pivotally mounting a third one of said link elements for rotation about a remote center of compliance disposed at a location adjacent an end of said third link and adjacent said axis;

and compliant means for permitting lateral translation of at least said end of said third link element relative to said axis



in response to a lateral force directed adjacent said center of compliance.

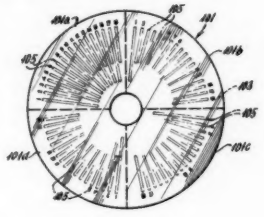
Re. 32,000
DEVICE FOR USE IN EARLY DETECTION OF BREAST CANCER

Zsigmond L. Sagi, Denville, N.J., assignor to B.C.S.I. Laboratories, Inc., Whippany, N.J.

Original No. 4,190,058, dated Feb. 26, 1980, Ser. No. 908,154, May 22, 1978. Application for reissue Feb. 23, 1982, Ser. No. 351,641

Int. Cl.⁴ A61B *10/00*

U.S. Cl. 128—736 **15 Claims**



1. A device for use in early detection of breast cancer, which device comprises:

(a) a flexible, heat-conductive web *divided into a plurality of sectors so disposed and of total area to contact simultaneously opposite side areas of the breast,*

(b) an adhesive layer on one side of said web and a [pealable] *peelable* layer removably adhered to said web by said adhesive layer,

(c) an array of spaced-apart [indicatorson the other side of said web] *indicators on each of said sectors* each of said indicators comprising a dye or a pigment and a temperature-sensitive substance having a relatively precise melting point approximately 0.5° F. different from the melting point of the temperature-sensitive substance in the adjacent indicator, and wherein each indicator displays a change in color upon melting of each of said temperature sensitive substance, and

(d) a transparent flexible layer conformably overlying said web and sealably secured thereto for visual examination of the change in color of said indicators.

Re. 32,001

METHOD AND APPARATUS FOR FEEDING CIGARETTES OR ANALOGOUS ARTICLES TO PACKING MACHINES OR THE LIKE

Günter Wahle, Reinbek, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

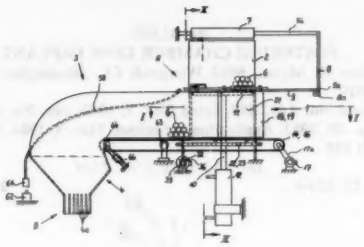
Original No. 3,854,611, dated Dec. 17, 1974, Ser. No. 245,409, Apr. 19, 1972. Continuation of Ser. No. 748,927, Dec. 9, 1976,. Application for reissue Jul. 19, 1978, Ser. No. 926,040

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1971, 2119311

Int. Cl.[4] B65G *65/04;* **B65B** *69/00*

U.S. Cl. 414—416 **27 Claims**

24. In a system for conveying cigarettes or other rod-like articles in containers, said system including an article delivery device and an article receiving device, means for inserting articles into containers, and means for conveying containers, apparatus for forming a stream of articles, comprising an unloading station; means for conveying through said unloading station a succession of containers containing batches of the articles; means for successively removing batches of articles from said containers; retaining means for receiving and confining batches of articles from said containers, said retaining means including spaced members arranged to confine each end of a batch; means for removing said spaced members from around said batch; and means for conveying away



from said unloading station, as a continuous stream after said spaced members have been removed, batches of articles received by said retaining means.

PLANT PATENTS

GRANTED OCTOBER 8, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,569

APPLE TREE 'RICO RED'

Richard Gonzalez, Royal City, Wash., assignor to Donald K. Merkeley; Walter A. Topinka and Floyd F. Myrick, all of Seattle, Wash., part interest to each

Filed May 18, 1983, Ser. No. 495,689
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—35 **1 Claim**

1. A new and distinct variety of apple tree similar in its anatomical and morphological characteristics to the parent tree "Sharp" Red Delicious, but distinguishable therefrom in the earlier coloration and maturity of its fruit, even under vigorous conditions, substantially as shown and described.

5,570

PEAR TREE "SAN JOAQUIN"

Robert E. Petersen, 11597 S. Academy, Selma, Calif. 93662

Filed Feb. 24, 1984, Ser. No. 583,330
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of pear tree substantially as illustrated and described and which is characterized by its fruit being early ripening occurring for picking about June 11 and reaching full maturity about June 20, by the color of the fruit having about June 11 a deep green ground color and a brown-red blush extending in a partially solid, partially striped pattern over 30 to 60 percent of the skin surface and at full maturity the ground color lightening to bright yellow and the blush to cherry red.

5,571

GERMAN IVY-PLANT 'MORRISON'S VARIEGATED'

Kenneth M. Morrison, P.O. Box 248, Forest Hill, La. 71430

Filed Jul. 18, 1983, Ser. No. 514,679
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Senecio mikanioides* substantially as described and illustrated.

PATENTS

GRANTED OCT. 8, 1985

ERRATA

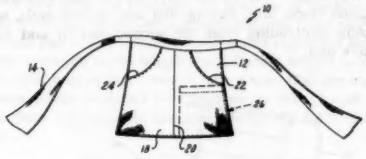
For CLASS	See PATENT NO.
623–011	4,545,081
623–001	4,545,082
116–315	4,545,246
122–254	4,545,311
188–067	4,545,322
239–003	4,545,525
029–589	4,545,610
384–585	4,545,627
408–197	4,545,711
416–138	4,545,733
416–146	4,545,734
433–018	4,545,760
514–557	4,545,990
514–100	4,545,991
514–161	4,545,992
514–456	4,545,993
514–514	4,545,994
514–523	4,545,995
514–629	4,545,996
514–627	4,546,112
514–636	4,546,113

PATENTS

GRANTED OCTOBER 8, 1985

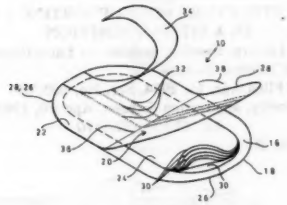
GENERAL AND MECHANICAL

4,545,079
WAITRESS APRON
Paula S. Bakken, 26071 Dow, Redford, Mich. 48239
Filed Apr. 16, 1984, Ser. No. 600,793
Int. Cl.[4] A41B *13/10*; A41D *27/20*
U.S. Cl. 2—48 **2 Claims**



1. A waitress apron comprising generally rectangular front and back panels affixed to each other along lower and opposed lateral side edges and along the lateral centerline, at least a portion of the upper edge of said front panel being unattached to said back panel so as to afford access to recesses formed between said front and back panels, apron strings oppositely and integrally projecting from the longitudinal upper edges of said front and back panels, a third rectangular panel positioned between said front and back panels and affixed to said back panel along side and bottom edges of said third panel, the upper edge of said third panel being disposed beneath said unattached portion of said front panel so as to be hidden beneath said front panel, and pressure/contact fastening means disposed along said upper edge of said third panel across the entire width thereof and along the opposing surface of said back panel.

4,545,080
DISPOSABLE UNDERARM PERSPIRATION PAD
Mary Gorham, 7843 Gleason Dr., Knoxville, Tenn. 37919
Filed May 30, 1984, Ser. No. 615,257
Int. Cl.[4] A41D *27/13*
U.S. Cl. 2—54 **9 Claims**



1. A disposable underarm perspiration pad adapted for being folded along a transverse crease for being releasably secured within a garment proximate the underarm area of said garment for protecting said garment from damage resulting from contact with perspiration, and for absorbing perspiration from the skin surface of the wearer of said garment, said underarm perspiration pad comprising:

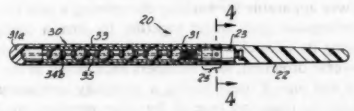
a first exterior panel having an exterior surface for contacting said skin surface of said wearer, said first exterior panel serving to wick said perspiration from said skin surface of said wearer;

a substantially perspiration impervious second exterior panel having an exterior surface for contacting said garment;

a perspiration absorbent filler mounted between said first exterior panel and said second exterior panel, said filler serving to absorb and retain said perspiration; and

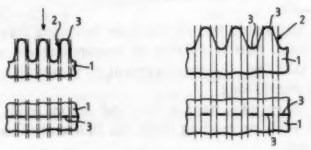
attachment means provided on said external surface of said second exterior panel for releasably securing said pad in said garment, said attachment means extending across said crease and being substantially perpendicular to said crease.

4,545,081
SEMI-RIGID PENILE PROSTHESIS WITH SEPARABLE MEMBERS AND POSTURE CONTROL
Jack Nestor, 110 1st Terr., Miami Beach, Fla. 33139, and John W. Devine, Jr., 4400 Bay Point Rd., Miami, Fla. 33137
Continuation of Ser. No. 278,480, Jun. 29, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,285
Int. Cl.[4] A61F *1/00*
U.S. Cl. 623—11 **19 Claims**



1. A penile prosthesis of the sem-rigid type comprising a proximal end member for separately sizing and implanting in the crus of the corpus cavernosum and a body member of predetermined semirigidity for separately sizing and implanting in the corpus cavernosum within the pendulus penis, each of said members having an adjacent end portion formed with an element of a quick engageable snap-in connector whereby said members are joined into a structural and functional unit after said separate sizing and implanting of the members, said unit having flexure means located in the region of the base of the penis when said members are implanted and joined permitting movement of the penis between erected and flaccid positions.

4,545,082
VASCULAR PROSTHESIS
Robert G. Hood, Paisley, Scotland, assignor to Vascutek Limited, Ayr, Scotland
PCT No. PCT/GB83/00088, § 371 Date Nov. 25, 1983, § 102(e) Date Nov. 25, 1983, PCT Pub. No. WO83/03347, PCT Pub. Date Oct. 13, 1983
PCT Filed Mar. 24, 1983, Ser. No. 561,590
Claims priority, application United Kingdom, Mar. 25, 1982, 8208852
Int. Cl.[4] A61F *1/24, 1/00*
U.S. Cl. 623—1 **5 Claims**



1. A vascular prosthesis which comprises a corrugated tube (1) of textile material is characterized by presenting a pattern of a series of separate axially disposed markings (3 or 4 or 5) on the corrugations (2), the disposition of the markings being such

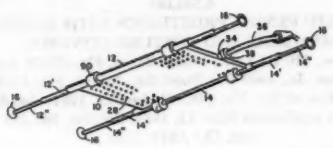
that when the prosthesis is extended to about the predetermined correct degree of extension whereby to increase the angle between opposite sides of each corrugation the observed pattern of markings along the prosthesis changes to provide a signal that the correct degree of extension has been attained.

4,545,083

BATHING SPRAY APPARATUS

Thomas E. Searson, 4808 Mill Reef Rd., Richmond, Va. 23150

Filed May 9, 1984, Ser. No. 608,434
Int. Cl.[4] B05B *1/04, 1/18*
U.S. Cl. 4—615 **2 Claims**



1. Shower apparatus for bathing comprising a pair of members superimposed and joined together to form a composite plate having its sides elongated more in one direction than in the transverse direction, said members each being in the form of a plate and one of them having a generally continuous flat face against the opposing face of the other member, the other of said members being of cast plastic material and having indentations into its said opposing face forming a series of side-by-side channels which extend within the composite plate in the direction of said elongation and which terminate at their ends adjacent to one end of the composite plate, and also forming a header space within and adjacent to the other end of the composite plate, said header space being connected to the other ends of the channels, means at said other end of the composite plate for conducting water to the header space, said conducting means being connectable to receive water from a water supply pipe, and said other member having a series of openings spaced along and extending from the respective channels through an exposed face of said other member, said openings having their central axes positioned to extend vertically when the composite plate extends horizontally, and a pair of parallel elongated support members extending along opposite sides of said plate in the direction of elongation of the plate, said support members being extensible and having means at their opposite ends for attachment to vertical wall surfaces, and means extending outwardly from said opposite sides of the plate and connecting it to said support members.

4,545,084

MODULAR DRIVE ARRANGEMENT FOR ADJUSTABLE BEDS AND THE LIKE

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Healthcare, Inc., Stevens Point, Wis.

Filed Feb. 3, 1984, Ser. No. 576,580
Int. Cl.[4] A61G *7/06*
U.S. Cl. 5—69 **35 Claims**

1. In an adjustable bed of the type having a frame, and a controller shaft that is rotated to manipulate an adjustable portion of said bed, the improvement of a modular drive arrangement, comprising:

a motor drive unit, having first and second ends, with an output shaft protruding from the first end of said motor drive unit;

a first coupling member located on the controller shaft of said bed;

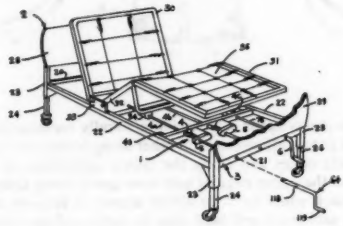
a second coupling member located on the output shaft of said motor drive unit, and shaped to mate with said first coupling member to releasably and selectively interconnect the output shaft of said motor drive unit with the controller shaft of said bed and transmit rotary motion therebetween;

means for preventing relative rotation between said motor drive unit and said bed frame during adjustment of said bed;

a first, quick-disconnect latch member located on said bed frame;

a second, quick-disconnect latch member located on the second end of said motor drive unit, and shaped to mate with said first quick-disconnect latch member to selectively support said motor drive unit on said bed frame;

a manual crank unit, having first and second ends, with a handle protruding from the second end of said manual crank unit;



a third coupling member located on the first end of said manual crank unit, and shaped to mate with said first coupling member to releasably interconnect said manual crank unit with the controller shaft of said bed and transmit rotary motion therebetween;

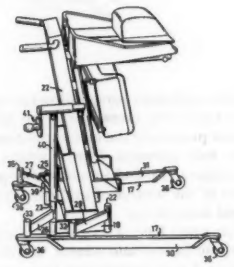
a bearing located on the second end of said manual crank unit, and having a third quick-disconnect latch member thereon which mates with said first quick-disconnect latch member to selectively and rotatably support said manual crank unit on said bed frame, whereby even relatively unskilled personnel without tools can remove said motor drive unit from said bed for off-site repair, and replace the same with said manual crank unit to insure uninterrupted operation of said bed, without disturbing the patient.

4,545,085

WHEELED STRUCTURE FOR SUPPORTING A PATIENT IN A SITTING POSITION

Mats Feldt, Liatorp, Sweden, assignor to Landstingens Inkopscentral LIC, Solna, Sweden

Filed Apr. 16, 1984, Ser. No. 600,830
Claims priority, application Sweden, Apr. 20, 1983, 8302229
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—81 R **2 Claims**



1. Wheeled structure for supporting a patient in a sitting position with the aid of raisable and lowerable arrangements designed for lifting a patient from e.g. a chair, a wheelchair or

other kind of seat and for transferring the patient to any desired place while leaving the patient in a sitting position, the base portion of the structure having two substantially lateral side members close to the floor, the ends of these members being provided with carrier wheels and adjustable or movable into different lateral positions for varying the width between the side members, characterized in that a short longitudinal side arm is disposed at either side of the substructure, said side arms being rigidly attached to each other for a fixed distance between them, and laterally adjustable long side members which are connected to the respective adjacent short side member via a pair of link arms for resetting the position of the long members by pivoting the link arms around vertical pivot shafts; and in that one pair of link arms disposed at one end of the substructure has mutually equal length but different length in relation to the other pair of link arms in such a way that the long side members when extended will diverge so that the width between them is greatest in the area above which the patient is seated.

4,545,086

PATTERN DESIGNS PRINTED WITH COMPUTER CONTROLLED PATTERN DYEING DEVICE

George C. Varner, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 312,903, Oct. 19, 1981, abandoned, which is a continuation of Ser. No. 169,828, Jul. 22, 1980, abandoned, which is a continuation of Ser. No. 43,091, May 29, 1979, abandoned, which is a division of Ser. No. 900,991, Apr. 28, 1978, Pat. No. 4,170,883, which is a division of Ser. No. 686,900, May 17, 1976, Pat. No. 4,116,626. This application May 31, 1983, Ser. No. 499,386

Int. Cl.⁴ D06B *1/02*

U.S. Cl. 8—151 **5 Claims**

1. An elongated textile material comprising:

(a) a number of repeats of a first pattern extending in a lengthwise direction of said textile material, each repeat of said first pattern after the first such repeat of said first pattern being immediately adjacent a preceding repeat of said first pattern, each repeat of said first pattern being defined by a border separating it from adjacent repeats; and

(b) a number of repeats of a second pattern extending in said lengthwise direction of said textile material from the final repeat of said first pattern, each repeat of said second pattern being defined by a border separating it from adjacent repeats, said second pattern being different from said first pattern, each repeat of said second pattern after the first such repeat of said second pattern being immediately adjacent a preceding repeat of said second pattern, the leading edge of the first repeat of said second pattern being spaced by a distance from the trailing edge of the final repeat of said first pattern in the lengthwise direction of said textile material, wherein said repeats of said first pattern and said repeats of said second pattern are arranged in an overall non-repeating sequence extending in said lengthwise direction.

4,545,087

TOOTHBRUSH

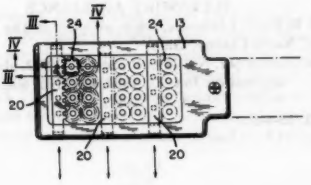
Sylvain Nahum, 16 Ave. Dumas, CH-1206 Geneva, Switzerland

Filed Aug. 30, 1983, Ser. No. 527,739

Claims priority, application Switzerland, Dec. 30, 1981, 8345/81

Int. Cl.⁴ A46B *13/02*

U.S. Cl. 15—22 R **12 Claims**



1. A tooth brush comprising a handle and a head portion in which are mounted movable supports in which tufts of bristles are secured and from which said bristles project,

said supports comprising at least one support of a first type mounted in said head portion for oscillation about an axis generally perpendicular to the bristles upon movement of said head portion rectilinearly in the plane of oscillation of said tufts, and

a plurality of supports of a second type each mounted in said head portion for rotation individually about an axis generally parallel to the bristles, and

means mechanically interconnecting said supports of said first type and said second type so that oscillation of said support of the first type causes rotation of said supports of the second type about their respective axes.

4,545,088

WINDSHIELD WIPER INSTALLATION

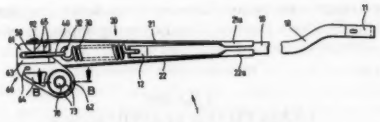
Alfred Kohler, and Oldrich Krizek, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,974

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132183

Int. Cl.⁴ B60S *1/34*

U.S. Cl. 15—250.35 **12 Claims**



1. A windshield wiper assembly comprising:

a wiper rod for carrying a wiper blade;

a fastening member having a bore for receiving a wiper shaft;

a link articulated on said fastening member, said link comprising a hollow member having two side walls and a center portion connecting said side walls;

a helical compression spring disposed within said hollow member and extending substantially in the longitudinal direction of said wiper rod, said helical compression spring having one end coupled to said wiper rod;

a yoke coupled to said fastening member for supporting the other end of said spring on said fastening member; wherein

said helical compression spring is positioned laterally staggered relative to said bore such that the center line of said spring is spaced apart from the longitudinal axis of said bore at a distance greater than the radius of said wiper shaft; and

said longitudinal axis intersects an imaginary line parallel to said wiper rod at a point between said one end of said helical compression spring and the point of support of said element on said fastening member.

4,545,089

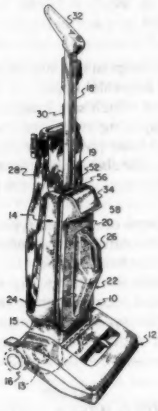
FLOOR CARE APPLIANCE WITH MOUNTED ACCESSORY APPLIANCE

Berton R. Oxel, Louisville, Ohio, assignor to The Hoover Company, North Canton, Ohio

Continuation of Ser. No. 419,615, Sep. 17, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 608,429

Int. Cl.⁴ A47L *9/00*

U.S. Cl. 15—323 **7 Claims**



1. An upright vacuum cleaner including an upwardly extending rigid housing, said rigid housing having a bottom pivoted to a lower rigid housing serving as a nozzle:

a handle extending upwardly from said upwardly extending rigid housing and having lower reaches, said lower reaches attached to said upwardly extending rigid housing,

said upwardly extending rigid housing having a recess formed in it intermediate its height,

said recess adapted for the receipt of a cleaning appliance or the like for transport of said cleaning appliance with said upright cleaner.

4,545,090

GLASS FILLED PLASTIC HINGE

Daniel R. Redmond, 6914 Cedar Ridge, Pinellas Park, Fla. 33565

Filed Sep. 24, 1984, Ser. No. 653,155

Int. Cl.⁴ E05D *5/00*

U.S. Cl. 16—385 **1 Claim**

1. A hinge member formed of plastic, wherein the improvement comprises:

a hinge body member formed of plasticized nylon and glass filled nylon;

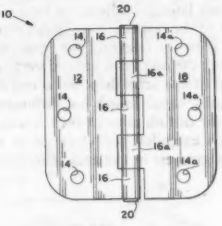
said hinge body member formed of fifty percent plasticized nylon;

said hinge body member formed of fifty percent glass filled nylon;

a hinge pin member;

said hinge pin member formed of plasticized nylon and glass filled nylon;

said hinge pin member formed of eighty percent plasticized nylon;



said hinge pin member formed of twenty percent glass filled nylon;

said glass filled nylon of which said hinge body member and said hinge pin member are formed, at least in part, including virgin or non-recycled glass filled nylon only.

4,545,091

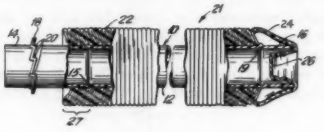
METHOD FOR STUFFING A CORED CASING ARTICLE

Joseph A. Nausedas, Oak Forest, and John H. Beckman, Downers Grove, both of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 29, 1983, Ser. No. 566,787

Int. Cl.⁴ A22C *11/02*

U.S. Cl. 17—49 **16 Claims**



1. A method for producing linked sausages comprising the steps of:

(a) providing a supply of cored casing articles, each including a tubular core having fore and aft ends and a supply of shirred casing on said core intermediate said ends;

(b) moving one of said casing articles from said supply to a stuffing position axially aligned with and between an aft drive means of a stuffing machine and a forward drive means axially aligned with and spaced forward of said aft drive means;

(c) moving one of said drive means towards the other until the fore and aft ends of said core are received in the respective forward and aft drive means;

(d) rotating said aft drive means and thereby rotating the casing article having its aft end received in said aft drive means;

(e) introducing a food emulsion axially through said aft drive means and into said tubular core while rotating said casing article, said food emulsion passing through the rotating core and into the casing at the fore end of said core; and

(f) rotating said forward drive means in unison with said aft drive means and passing the casing stuffed with the food emulsion through said forward drive means which grips and rotates the stuffed casing and continuing the introduction of food emulsion until the supply of shirred casing has been exhausted.

4,545,092
SQUID TRIMMING APPARATUS

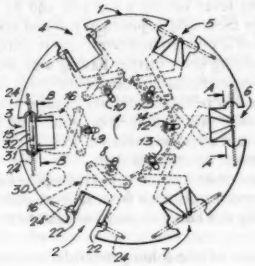
Sven Olsson, Hälsingborg, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 6, 1983, Ser. No. 558,484

Claims priority, application European Pat. Off., Aug. 25, 1983, 83108359.7

Int. Cl.⁴ A22C *29/02*

U.S. Cl. 17—71 **9 Claims**



1. An apparatus for the mechanical trimming of molluscs, especially squid, comprising

(a) a station for attachment of the squid to holding means for holding it during the trimming;

(b) a station having cutting means for cutting the tentacles of the squid, leaving its head;

(c) a station having a cutter for loosening the viscera of the squid from its mantle wall, and with gripping means for gripping and extracting the head of the squid with its associated viscera from the mantle;

(d) a station having means for removing at least part of the tissue on the inside part of the mantle located above the pen in the squid;

(e) a station having gripping means for gripping and extracting the pen from the mantle;

(f) a station for removal of the trimmed mantle from the holding means; and

(g) means for transporting the holding means with the squid successively through the stations (a)–(f) and for returning the holding means to the station (a) for receiving a new squid

characterised in that the holding means comprises arms pivotally connected to one another and a pair of elongated holding pins, one of said pins being mounted to each of said arms, said pins extending codirectionally with one another from said arms, said arms being movable relative to one another between an open position wherein the pins are remote from one another and a closed position wherein the pins are adjacent one another, said holding means further comprising resilient means for biasing said arms toward said open position, whereby when a squid is mounted on said pins so that the mantle of the squid envelopes the pins, the pins will bear upon the interior of the mantle under the influence of said biasing means.

4,545,093
SLIVER COILER

Peter Jagst, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. Kg, Monchen-Gladbach, Fed. Rep. of Germany

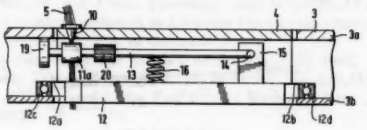
Filed May 25, 1984, Ser. No. 614,132

Claims priority, application Fed. Rep. of Germany, May 25, 1983, 3318944

Int. Cl.⁴ B65H *54/80*

U.S. Cl. 19—159 R **12 Claims**

1. In a sliver coiler including a machine frame; a rotary head being supported in the machine frame and having a rotary axis; means for rotating said rotary head about said rotary axis; a pair of parallel extending cooperating feed rollers rotatably supported in said rotary head for drawing sliver into said rotary head and discharging the sliver therefrom to deposit the sliver underneath the rotary head; a sliver coiler component surrounding said rotary head and having a circular track; during rotation said rotary head turning relative to said sliver



coiler component; and driving means for rotating said feed rollers; the improvement wherein said driving means comprises a runner element rotatably supported by said rotary head; said runner element being in a frictional contact with said circular track for running thereon during rotation of said rotary head; and torque-transmitting means for applying a driving torque from said runner element to said feed rollers.

4,545,094
EXTENSIBLE CLASP FOR USE WITH FLEXIBLE WRISTLET

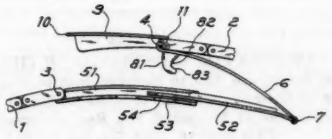
Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Bienne, Switzerland

Filed May 9, 1984, Ser. No. 608,337

Claims priority, application Italy, May 13, 1983, 21091 A/83

Int. Cl.⁴ A44C *5/24*

U.S. Cl. 24—71 J **8 Claims**



1. An extensible clasp for use with a flexible wristlet, comprising first and second elongated portions, hinge means for connecting to each other one end of said portions and means at the opposite end of said portions for pivotally connecting said portions to portions of said wristlet, said first portion being provided near its opposite end with a projecting locking element having a transverse recess therein and said second portion having first and second parts mounted for longitudinal sliding motion one relatively to the other, said first part being connected to said first portion by said hinge means and being formed with a hole at a distance from said hinge means substantially equal to the distance separating said hinge means from the locking element, and said second part being formed along the length thereof with a plurality of holes each able selectively to be brought into alignment with the hole in said first part by relative sliding motion of said first and second parts to enable the locking element to extend therethrough upon closure of the clasp, said recess being engageable with an edge portion of the hole through which it extends in said second part to lock the clasp once closed.

4,545,095
EXTENSIBLE CLASP FOR USE WITH A FLEXIBLE WRISTLET

Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Bienne, Switzerland

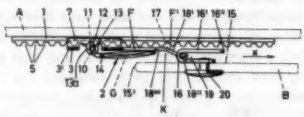
Filed May 9, 1984, Ser. No. 608,339
Claims priority, application Italy, May 13, 1983, 21828/83[U]
Int. Cl.⁴ A44C 5/24
U.S. Cl. 24—71 J **7 Claims**

1. An extensible clasp for use with a wristlet of flat flexible material having a first end portion formed with a loop and a second end portion providing at least one aperture, said clasp comprising first and second elongated portions, hinge means for connecting to each other one end of said elongated portions whereby said elongated portions may be folded against each other, means at the opposite end of said first elongated portion for pivotally connecting said first elongated portion to the loop of said first end portion, and means on said second elongated portion for connecting said second end portion to the opposite end of said second elongated portion, said first elongated portion being formed with a hole near said pivotal connection means, said second elongated portion including a flattened sleeve-like member having a pair of spaced apart walls and defining a longitudinally extending passage into which may be inserted at said opposite end of said second elongated portion said second end portion, one of said walls carrying said hinge means and a projecting locking element, having a transverse recess therein, at a distance from said hinge means substantially equal to the distance separating said hinge means from said hole such that when said first elongated portion is folded against said one wall said locking element can be made to penetrate said hole, said recess being engageable with an adjacent edge portion of the hole to lock the clasp, said second elongated portion further including a hole and said connecting means including a peg insertable in said latter hole and through said aperture to secure said second end portion in said passage.

4,545,096
FASTENER FOR WAISTBANDS OR THE LIKE

Lothar Belter, and Alberto Stoecker, both of Wuppertal, Fed. Rep. of Germany, assignors to Schaeffer Scovill Verbindungstechnik GmbH, Wuppertal, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 473,913
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215470
Int. Cl.⁴ A44B 19/00
U.S. Cl. 24—585 **7 Claims**



1. In a hook and eye type fastener for a garment waistband having an underlying part and an overlying part, wherein the eye portion of the fastener is carried by a slide displaceably secured to an adjustment rail fastened to one of said parts and the hook portion is secured to the other of said parts, and wherein the eye portion includes a first member provided with a window opening bounded at an end of said first member by a transverse web, and the hook portion includes a second member constituting a hook and being of substantially U-shaped form, with one leg of the hook lying against and being secured to said other part of the waistband, the other leg of the hook being spaced from and extending along said one leg to terminate in a free end edge, and the bend of the hook being directed toward the slide so as to enable said other leg of said hook to be inserted into and through said window opening for causing the hook to be hooked over said transverse web of said first member, and wherein said slide carries a two-ended folding lever which is pivoted adjacent one of its ends to the slide on the side of the latter facing away from said adjustment rail, with the folding lever having a top side and an underside of which the latter faces said adjustment rail and said slide when said folding lever is pivoted into overlying relation to the slide, and with the folding lever further having a projection extending generally perpendicularly from its underside and formed as a detent adapted to releasably tightly engage said adjustment rail and immobilize said slide thereon when said folding lever is pivoted into said overlying relation to said slide;

the improvement comprising that:

(a) said first member is constructed to dispose said transverse web at a greater distance from said adjustment rail than substantially the entire expanse of said window opening, and

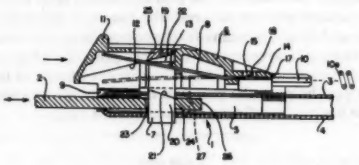
(b) said top side of said folding lever defines a guide surface which has a first end region proximate to said one end of said folding lever and a second end region proximate to the other end of said folding lever, said guide surface, when said folding lever is in said overlying relation to said slide, sloping from said first to said second end region thereof in a manner to dispose said second end region of said guide surface (i) proximate to the end of said window opening remote from said transverse web of said first member and (ii) at a smaller distance from said adjustment rail than said transverse web,

(c) said guide surface being engageable by said free end edge of said other leg of the hook to enable that edge to be slid along said guide surface so as to enter said window opening and pass between said transverse web and said adjustment rail without any displacement of said folding lever out of said overlying relation thereof to said slide.

4,545,097
LOCK FOR A SAFETY BELT

Franz Wier, Schwäbisch-Gmünd, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Aldorf, Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,026
Claims priority, application Fed. Rep. of Germany, Feb. 5, 1980, 3004150
Int. Cl.⁴ A44B 11/26
U.S. Cl. 24—642 **17 Claims**



1. A buckle assembly for use with a seat belt to restrain an occupant of a vehicle, said buckle assembly comprising a base which at least partially defines an opening into which a tongue is insertable, a latch member movable transversely to the path of insertion of the tongue into said base, said latch member being movable between an engaged position extending into the path of movement of the tongue to block withdrawal of the tongue from said buckle assembly and a release position in which said latch member is ineffective to block withdrawal of the tongue from said buckle assembly, a slide member movable

along the base transversely to the path of movement of said latch member, said slide member being movable along said base between an extended position and a retracted position, actuator surface means on said slide member for moving said latch member to the release position upon movement of said slide member from the extended position to the retracted position, spring means for urging said latch member toward the engaged position, first detent surface means connected with said slide member for engaging a first side surface area on said latch member to hold said latch member in the release position against the influence of said spring means, and second detent surface means connected with said slide member for engaging a second side surface area on said latch member to hold said latch member in the engaged position, said first detent surface means being movable out of engagement with said first side surface area on said latch member by movement of said slide member from the extended position toward the retracted position to release said latch member for movement from the release position to the engaged position under the influence of said spring means, said second detent surface means being movable into engagement with said second side surface area on said latch member by movement of said slide member from the retracted position to the extended position with said latch member in the engaged position.

4,545,098

PIN OR CLIP CHAIN FOR WEB TENSIONING OR STRETCHING MACHINES

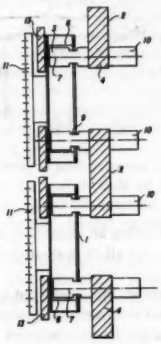
Franz-Josef Schroer, Erkelenz, Fed. Rep. of Germany, assignor to A. Monforts GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 431,636

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138777

Int. Cl.⁴ D06C *3/10*

U.S. Cl. 26—89 **10 Claims**



1. A chain for a web tensioning machine, comprising a plurality of chain links, a plurality of connection chain links, a plurality of connection pins, each respective connection pin holding one of said chain links and one of said connection chain links together forming units of a complete chain, in each unit said chain link having a C-shaped box section with a side disposed in a given plane having an opening formed therein and longitudinal ends, a bearing half-shell being disposed in each of said longtitudinal ends of said C-shaped box section, and a web edge retaining bar connected to said chain link for retaining a web, said bearing half-shells having axes extended perpendicular to said plane formed by said open side of said C-shaped box section, and said connection pin being fixed to said connection chain link and insertible in said opening formed in said C-shaped box section to engage one of said bearing half-shells and means on said connection pin to prevent disengagement of said links during operation of the machine.

4,545,099

DEVICE FOR INDIVIDUALLY SEPARATING AND READYING WARP THREADS FOR THREADING INTO HEDDLES AND DROP WIRES

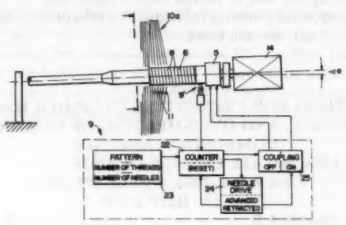
Claus Tovenrath, and Frank Tovenrath, both of Lindau, Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 430,282, Sep. 30, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,353

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210920

Int. Cl.⁴ D03J *1/14*

U.S. Cl. 28—202 **11 Claims**



1. In a device for individually separating and readying warp threads (**10***a*) wound on a warp beam and presented in the form of a curtain of threads (**10***a*) for a draw-in procedure of warp threads into apertures of heddles and drop wires by means of a warp thread draw-in apparatus equipped with mutually parallel draw-in needles (**11**), the improvement comprising a rotatable tensioning shaft (**1**) mounted behind the curtain of threads (**10**) transversely to the direction of the threads, said tensioning shaft gradually merging at its end in a transition (**2**) into a cylindrical end part (**3**) of larger diameter, drive means (**14**) operatively connected to said tensioning shaft for rotating said tensioning shaft, a cylindrical sleeve (**6**) having a larger diameter than said cylindrical end part of said tensioning shaft, said cylindrical sleeve further comprising a screw-like guidance groove (**8**) including a guide beak (**7**) leading into said guidance groove (**8**) for guiding an individual warp thread into said screw-like guidance groove, means (**26**) coaxially and rotatably mounting said cylindrical sleeve (**6**) on said tensioning shaft (**1**), said mounting means (**26**) enabling said cylindrical sleeve to rotate with said tensioning shaft and to permit rotation of said tensioning shaft independently of said cylindrical sleeve (**6**) when the latter is stopped, and control means operatively arranged for controlling the rotation of said cylindrical sleeve (**6**) with said tensioning shaft and for stopping said cylindrical sleeve relative to said tensioning shaft to thereby determine the number of full revolutions of said cylindrical sleeve for guiding a respective number of warp threads into said screw-like guidance groove.

4,545,100

METHOD AND APPARATUS FOR MANUFACTURING VENETIAN BLINDS

Adrianus J. C. Gaillard, Zwijndrecht, Netherlands, and Richard N. Anderson, Owensboro, Ky., assignors to Hunter Douglas International N.V., Willemstad, Netherlands Antilles

Filed Jun. 24, 1983, Ser. No. 506,881

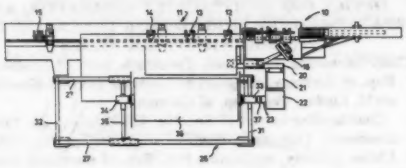
Claims priority, application United Kingdom, Jul. 23, 1982, 8221426

Int. Cl.⁴ B23P *19/04*

U.S. Cl. 29—24.5 **9 Claims**

1. A method of manufacturing venetian blinds comprising the steps of:

(a) providing at least two ladder tapes of a length sufficient for several venetian blinds;
(b) inserting venetian blind slats into said ladder tapes to form a substantially continuous mat of slatted ladder tapes,



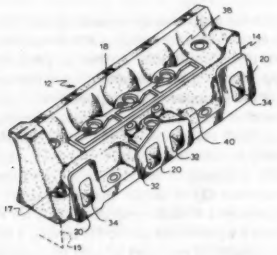
said continuous mat being of sufficient length for several venetian blinds;
(c) storing the mat of slatted ladder tapes; and
(d) subsequently cutting individual lengths of said mat, each of a length for one blind.

4,545,101

METHOD FOR PREVENTING CYLINDER HEAD WARPAGE, AND OVER-HEATING OF INTERNAL COMBUSTION ENGINES

John R. Hilts, Box 413, Cheney, Kans. 67025

Filed Feb. 1, 1984, Ser. No. 575,794
Int. Cl.[4] B23P *15/00*
U.S. Cl. 29—156.4 R **7 Claims**



1. A method of preventing cylinder head warpage and overheating of internal combustion engines, comprising:
(a) removing anchor bolt members that are holding a cylinder head structure against a cylinder block structure;
(b) applying an expansion transfer plate assembly to an area above the exhaust ports on said cylinder head structure;
(c) inserting bolt members through holes in said main expansion transfer plate assembly so as to anchor same against said cylinder head structure and to said engine block structure; and
(d) torquing said bolt members to an even desired pressure to clamp said expansion transfer plate assembly against said cylinder head structure;
whereby said expansion transfer plate assembly applies a large surface area to an upper surface of say cylinder head structure to control expansion and to prevent warpage thereof.

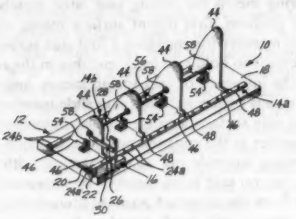
4,545,102

TOOLING FOR AND METHOD OF FABRICATING MASTER MODELS

Fred F. Grabos, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 23, 1983, Ser. No. 510,147
Int. Cl.[4] B23Q *17/00, 3/00*; **A61B** *5/08*
U.S. Cl. 29—407 **17 Claims**

11. A method of aligning headers for a master model, with steps comprising: utilizing a flat surface as a base, placing an index bar on the base with one side of the bar establishing a buttock line, machining a series of headers to shape with reference to the base and buttock line, placing a second index bar on the base and aligning it with respect to the first index bar, establishing header locations along the base by utilizing the



index bars, placing the headers on the base and against the buttock line and along the established header locations and securing the headers to the base, and aligning the headers vertically and securing them in position with respect to each other for forming master models

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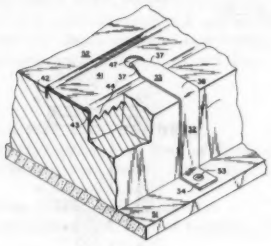
4,545,103

METHOD OF SECURING AN INSULATION MEMBER TO A WALL OR WALL-STUD ASSEMBLY

George E. Bryant, Renton, Wash., assignor to W. R. Grace & Co., Lexington, Mass.

Division of Ser. No. 364,079, Mar. 31, 1982, Pat. No. 4,438,611.
This application Jan. 13, 1984, Ser. No. 570,559
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—432 **4 Claims**



1. A method of securing an insulation member having front and back surfaces to a wall or wall-stud assembly comprising the steps of:
pressing a stud member into said front surface of said insulation member, said stud member comprising a substantially flat elongated strip having at least one leg depending therefrom and having at least one aperture in its surface;
positioning said insulation member against said wall or wall-stud assembly with said back surface in a substantially contiguous, face-to-face relation with said wall or wall-stud assembly;
engaging a bracket with said stud member, said bracket comprising (a) a planar web, (b) substantially flat first and second legs depending from opposite ends of said web at an angle and in opposite directions and (c) a tab depending from said first leg on the same side thereof as said web, said bracket being engaged with said stud member by inserting said tab into said aperture with said first leg in part transversely superposed with said strip and in part transversely extending out from said strip so as to provide a transversely extending arm segment;
said stud member being positioned with respect to an edge of

said insulation member such that said arm segment extends at least to said edge and said web extends closely adjacent the side surface of said insulation member, said web being substantially equal in length to the width of said side surface such that said second leg is coplanar with said back surface; and

securing said bracket and said insulation member to said wall or wall-stud assembly by inserting fastening means through said second leg and into said wall or wall-stud assembly.

4,545,104

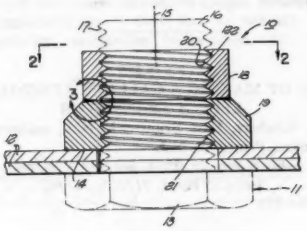
METHOD OF FORMING A FATIGUE RESISTANT THREADED CONNECTION

Mark Hattan, Orange, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Continuation-in-part of Ser. No. 111,774, Jan. 14, 1980, abandoned. This application May 20, 1982, Ser. No. 380,439

Int. Cl.[4] B23P *11/02, 19/06*

U.S. Cl. 29—446 **6 Claims**



1. The method of forming a fatigue resistant threaded connection that comprises:

connecting together a screw having an external thread and a nut having two aligned internal threads of a common pitch engaging said external thread at different locations, with said two internal threads being secured together before engagement with the screw in fixed relative positions in which one internal thread is not a true helical continuation of the other, and in which portions of the two internal threads lying in a common axial plane are spread slightly farther apart axially than if the internal threads were true helical continuations of one another;

initially applying force to said external thread of the screw by each of said two internal threads of the nut in a direction axially away from the other internal thread of the nut by virtue of said slightly spread condition of the internal threads;

then tightening said screw and nut threadedly relative to one another against the resistance of engaged stop shoulder surfaces to a preloaded condition stretching said screw axially relative to said nut; and

in said preloaded condition applying force to said external thread of the screw by said two internal threads of the nut in a common axially outer direction rather than in opposite directions axially away from one another.

4,545,105

METHOD OF MAKING BRIGHT-FACED REINFORCED PLASTIC BUMPER

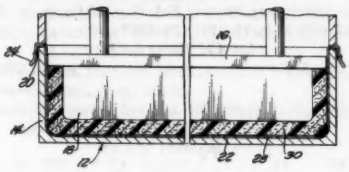
Martin I. Kowalsky, Rochester, Mich., assignor to Autodynamics Corporation of America, Madison Heights, Mich.

Division of Ser. No. 310,374, Oct. 13, 1981, abandoned. This application Nov. 1, 1983, Ser. No. 529,747

Int. Cl.[4] B21D *35/00*

U.S. Cl. 29—469.5 **8 Claims**

1. A method of forming a structural article including a plastic body portion having an outer surface and including a single sheet of metal stretched to be disposed about and fixedly secured to the outer surface, the method including the steps of placing a sheet of metal having an adhesive covered upper surface over a female mold cavity, preheating a sheet of plastic material to a temperature slightly above its melting point to soften the sheet, placing the preheated and softened sheet of plastic over said adhesive covered metal sheet, and drawing



and compressing the metal sheet and softened plastic sheet into the female mold cavity to simultaneously cool the plastic material during the compression to set the molded plastic and stretch the metal about the outer surface of the molded plastic so as to form a structural member having a metal trim on the outer surface thereof adhesively bonded to the molded plastic.

4,545,106

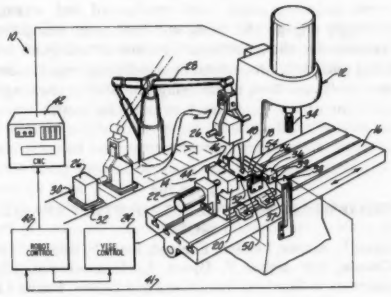
MACHINE SYSTEM USING INFRARED TELEMETERING

Richard O. Juengel, Romeo, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 259,257, Apr. 30, 1981, Pat. No. 4,401,945. This application Sep. 3, 1982, Ser. No. 414,734

Int. Cl.[4] B23Q *15/00*

U.S. Cl. 29—563 **17 Claims**



1. In an automated machining system having a movable workpiece holder for holding a workpiece during machining of the workpiece, the improvement comprising:

transducer means for detecting at least one given relative position between the workpiece and the workpiece holder, operative to generate an electrical signal in response to detection of said given position;

transmitter means coupled to the transducer for selectively transmitting an infrared frequency light signal in response to the transducer signal, said transmitter being mounted for movement with the workpiece holder;

remote receiver means for converting said infrared signal into an electrical signal; and

means for coupling the signal from said receiver means to a device for controlling an operation on the workpiece.

4,545,107

TOOL CARRYING MAGAZINE FOR A TOOL HANDLING MACHINE

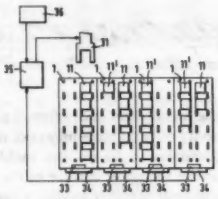
Bernhard G. Bellmann, Laudenbach; Horst W. Birkner, Karlsruhe, and Theo Kaminsky, Pfungstadt, all of Fed. Rep. of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

Filed Jul. 17, 1981, Ser. No. 284,463

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027460; Mar. 17, 1981, 3110307

Int. Cl.[4] B23Q *3/155*

U.S. Cl. 29—568 **26 Claims**



1. In a tool machine of the type comprising at least one tool magazine which removably carries a plurality of tools, and a tool gripping device which grips tools individually from the magazine and transports them to a tool fixture of the machine, the improvement wherein:

a magazine fixture is provided, said magazine comprising a self-contained unit which is removably mounted on said magazine fixture,

said magazine and said magazine fixture being provided with interengageable means for aligning and fastening said tool magazine on said magazine fixture,

said magazine including a guide track which mounts a plurality of tools for movement in the lengthwise direction of said guide track, and

feeding means mounted on said magazine fixture and being arranged for shifting all of said tools in said guide track at the same time, said feeding means comprising at least one feed comb including comb teeth configured and arranged to drivingly engage said tools, said feed comb being movable transverse to the lengthwise direction of said guide track to bring said teeth into and out of said driving engagement with said tools, said feed comb being movable in the lengthwise direction of said guide track to shift said teeth.

4,545,108

COLD-WELDING OF ELECTROLYTIC CAPACITOR ROLLS

Graham L. Adams, London, England; Peter F. Briscoe, Trenton, Canada, and Arthur F. Dyson, Gorleston-on-sea, England, assignors to Standard Telephones and Cables, Public Limited Company, London, England

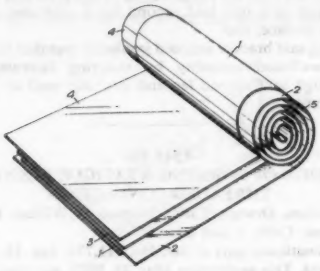
Filed Dec. 7, 1983, Ser. No. 558,899

Claims priority, application United Kingdom, Dec. 7, 1982, 8234870; Dec. 7, 1982, 8234871

Int. Cl.[4] H01G *9/24, 9/04*

U.S. Cl. 29—570 **4 Claims**

1. A method of manufacturing an aluminum electrolytic capacitor roll including the step of securing a piece of tabbing to a plurality of layers of anode or cathode aluminum foil in a single cold-welding operation using radiussed weld tooling of complementary curvature which distorts the aluminum sufficiently to provide adhesion and electrical connection between the layers, wherein the weld tooling is provided with a cutting edge which is employed to cut at least the outer layers of the foil along a line substantially perpendicular to the roll axis and wherein the layers of anode or cathode foil are formed by forming a roll of anode and cathode foils together with separator material, with the anode foil protruding from one end of the roll and the cathode foil protruding from the other, and



wherein the weld tooling is configured to produce welds that are convex with respect to the roll axis.

4,545,109

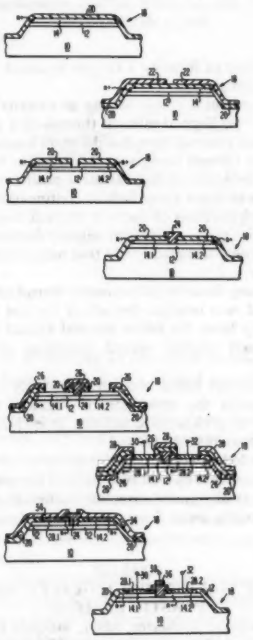
METHOD OF MAKING A GALLIUM ARSENIDE FIELD EFFECT TRANSISTOR

Walter F. Reichert, East Brunswick, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 21, 1983, Ser. No. 459,756

Int. Cl.[4] H01L *21/205, 21/302*

U.S. Cl. 29—571 **8 Claims**



1. A method of producing a semiconductor device, comprising the steps of:

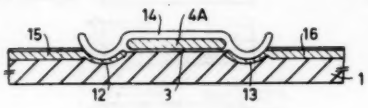
forming a doped layer of a III-V compound material on the surface of a substrate of semi-insulating III-V compound material, the layer doped to a first concentration of a given conductivity type;

forming a mesa by etching through portions of the doped layer and partially through the thickness of the substrate;
forming a first aperture in the doped layer to expose a portion of the substrate;
growing a channel region of the III-V compound material in the aperture to a sufficient thickness to extend laterally, partially over and insulated from the surface of the doped layer, the channel region doped to a second, lower concentration of the given conductivity type;
forming a Schottky contact to the channel region; and
forming ohmic contacts on the surface of the doped layer which are positioned such that the ohmic contacts are spaced apart from the channel region.

4,545,110
METHOD OF MANUFACTURING AN INSULATED GATE FIELD EFFECT DEVICE

Henricus G. R. Maas; Francois M. Klaassen, and Johannes A. Appels, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 447,843, Dec. 8, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,603
Claims priority, application Netherlands, Jul. 5, 1982, 8202686
Int. Cl.⁴ H01L *21/263*
U.S. Cl. 29—571 **16 Claims**

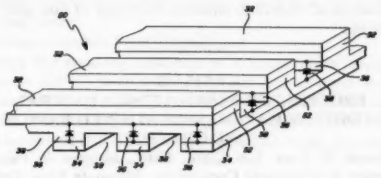


1. In a method of manufacturing an insulated gate field effect device the steps comprising
providing a semiconductor region of a first conductivity type,
providing an electrically insulating layer on a surface of said semiconductor region at least at an area where a gate electrode is to be formed,
forming a first silicon layer over at least said electrically insulating layer,
providing a first oxidation preventing layer on said first silicon layer,
providing a second silicon layer on said first oxidation preventing layer,
removing at least a portion of said second silicon layer to form edges at remaining parts of said second silicon layer, said edges substantially coinciding with edges of said gate electrode to be formed,
thermally oxidizing said edge portions of said second silicon layer to form oxidized edge portions,
selectively etching away exposed portions of said first oxidation preventing layer,
etching away said oxidized edge portions with previously covered portions of said first oxidation preventing layer remaining on said first silicon layer,
thermally oxidizing exposed portions of said first silicon layer,
etching away said remaining exposed portions of said first oxidation preventing layer and said first silicon layer thereunder at least down to said electrically insulating layer to form openings,
implanting ions into said semiconductor region at a first doping concentration through said openings in said first silicon layer to form source and drain zone extensions of a second conductivity type at opposite sides of said gate electrode to be formed,
etching away all remaining exposed oxide portions, and
thermally oxidizing thus exposed surfaces of said first silicon layer to form a thermal oxide layer covering said gate electrode formed of said first silicon layer between said source and drain extensions.

4,545,111
METHOD FOR MAKING, PARALLEL PREPROGRAMMING OR FIELD PROGRAMMING OF ELECTRONIC MATRIX ARRAYS

Robert R. Johnson, Franklin, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 458,919, Jan. 18, 1983,. This application Jul. 14, 1983, Ser. No. 513,997
Int. Cl.⁴ H01L *21/46*
U.S. Cl. 29—574 **59 Claims**



1. A method of making an electronic matrix array comprising the steps of:
forming at least one layer of phase changeable material on a conductive substrate, said phase changeable material having a substantially nonconductive state and a comparatively high conductive state, said layer being formed in one of said states;
parallel programming said layer by irradiating selected areas of said layer to simultaneously convert said selected areas of said layer to the other one of said states to form selected substantially nonconductive portions of said layer and selected comparatively high conductive portions of said layer;
forming first and second sets of electrically conductive address lines on respective opposite sides of said layer, said address lines of said first and second sets being formed for crossing at an angle to form a plurality of crossover points; and
said selected substantially nonconductive layer portions and said selected comparatively high conductive layer portions being formed between said first and second sets of address lines.

22. The method as defined in claim 1, including testing said selected portions to insure that the portions are in their programmed states.

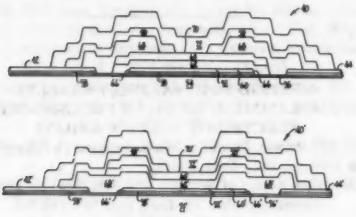
4,545,112
METHOD OF MANUFACTURING THIN FILM TRANSISTORS AND TRANSISTORS MADE THEREBY

Scott H. Holmberg, and Richard A. Flasck, both of San Ramon, Calif., assignors to Alphasil Incorporated, Sunnyvale, Calif.

Filed Aug. 15, 1983, Ser. No. 523,654
Int. Cl.⁴ H01L *29/78, 27/02*
U.S. Cl. 29—577 R **14 Claims**

1. A method of manufacturing thin film transistors comprising:
providing a substrate;
depositing a gate electrode on said substrate having at least one exposed edge;
depositing a gate insulator on said gate electrode;
depositing a semiconductor material on said insulator;

depositing an intermetal dielectric adjacent said edge of said gate electrode; and



depositing a drain electrode onto at least a portion of said intermetal dielectric adjacent said edge of said gate electrode.

4,545,113

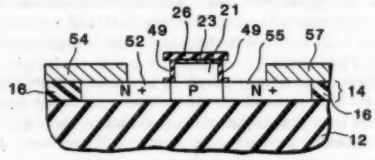
PROCESS FOR FABRICATING A LATERAL TRANSISTOR HAVING SELF-ALIGNED BASE AND BASE CONTACT

Madhukar B. Vora, Los Gatos, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 199,771, Oct. 23, 1980, abandoned. This application Aug. 29, 1983, Ser. No. 527,146

Int. Cl.⁴ H01L *21/22, 21/265*

U.S. Cl. 29—578 **10 Claims**



1. A process for fabricating a lateral bipolar transistor with self-aligned low resistance base contact comprising:

sequentially depositing on an underlying first conductivity type layer of semiconductor material a first polycrystalline silicon layer, then a metal silicide layer;

forming on the metal silicide layer a three-layer sandwich having a lower, a middle and an upper layer, the upper and lower layers of the three-layer sandwich being substantially impervious to a selected impurity, but not the middle layer;

removing a portion of the upper and the middle layers to define an edge;

introducing selected impurity into the middle layer through the edge to define a zone of impurity in the middle layer;

removing all of the upper layer, then all of the middle layer except for the zone of impurity;

removing all of the lower layer and the metal silicide layer except where each of these is overlaid by the zone of impurity, thereby to define a remaining region of the lower layer;

removing all of the metal silicide layer except that portion overlaid by the remaining region, then removing all of the zone of impurity and all of the first polycrystalline silicon layer except that portion of the first polycrystalline silicon layer overlaid by the remaining region to thereby provide a metal silicide/polycrystalline silicon contact to the first conductivity type layer of semiconductor material;

laterally etching the metal silicide layer and the first polycrystalline silicon layer to undercut the lower layer;

forming insulating material over all of the first polycrystalline silicon layer, the metal silicide and the first conductivity type layer of semiconductor material except where the first conductivity type layer of semiconductor material is overlaid by the first polycrystalline silicon layer;

removing all of the insulating material except that masked by the lower layer; and

using the lower layer as a mask, introducing opposite conductivity type impurity into the first conductivity type layer of semiconductor material to thereby form a collector and an emitter of a lateral bipolar transistor.

4,545,114

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

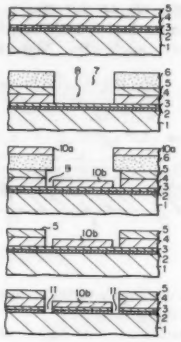
Takashi Ito, Kawasaki; Toshihiro Sugii, Tokyo; Tetsu Fukano, Kanagawa, and Hiroshi Horie, Ebina, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

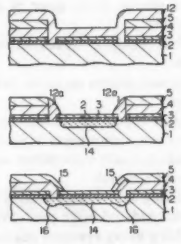
Filed Sep. 29, 1983, Ser. No. 537,017

Claims priority, application Japan, Sep. 30, 1982, 57-172027; Sep. 30, 1982, 57-172024; Sep. 30, 1982, 57-172025; Sep. 30, 1982, 57-172026

Int. Cl.⁴ H01L *21/302, 21/31*

U.S. Cl. 29—579 **18 Claims**





1. A method of producing a semiconductor device having a substrate, comprising the steps of:

(a) forming an insulating film on the semiconductor substrate;

(b) forming a first conductive film on the first insulating film;

(c) forming a first masking film having a window on the first conductive film;

(d) selectively etching the first conductive film to form an opening having similar dimensions to those of the window;

(e) transversely etching the first conductive film to enlarge the opening and to form a protruding portion of the first masking film;

(f) forming, through the window, a second masking film on the insulating film;

(g) selectively etching an uncovered portion of the insulat-

ing film under the protruding portion to expose a surface portion of the semiconductor substrate; and

(h) forming a second conductive film connecting a side of the first conductive film and the exposed surface portion of the semiconductor substrate.

4,545,115

METHOD AND APPARATUS FOR MAKING OHMIC AND/OR SCHOTTKY BARRIER CONTACTS TO SEMICONDUCTOR SUBSTRATES

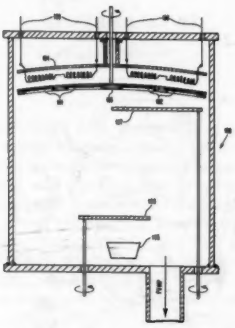
Hans J. Bauer, Boeblingen, and Bernd Garben, Schonaich, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1983, Ser. No. 565,080

Claims priority, application European Pat. Off., Feb. 4, 1983, 81 101 059.0

Int. Cl.⁴ H01L *21/28*

U.S. Cl. 29—590 **12 Claims**



1. A low temperature method for fabricating a silicon dioxide-free conductive contact on a semiconductor substrate having integrated circuit devices thereon, said method comprising:

(a) placing a semiconductor substrate having integrated circuit devices (device substrate) and atleast one clean, blank silicon substrate in a deposition chamber maintained at a predetermined low pressure;

(b) heating said substrates to a low temperature in the range of 330° C. to 550° C.;

(c) shielding said device substrate by means of a shutter arranged in close proximity to said device substrate;

(d) depositing a conductive metal on said atleast one blank substrate at said low temperature and pressure for a short period of time to remove any trace of oxygen in said chamber by chemisorption of said oxygen by said atleast one blank substrate and thereby establishing an oxygen-free environment in said chamber;

(e) unshielding said device substrate by opening said shutter; and

(f) depositing on atleast a selected portion of said device substrate said conductive metal at said low temperature and pressure in said oxygen-free environment; whereby is formed on said atleast a selected portion of said device substrate a conductive metal contact free of an oxide layer.

4,545,116

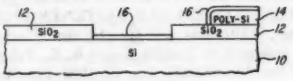
METHOD OF FORMING A TITANIUM DISILICIDE

Chi K. Lau, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 6, 1983, Ser. No. 492,069

Int. Cl.⁴ H01L *21/285, 29/46*

U.S. Cl. 29—591 **8 Claims**



8. A method of forming titanium disilicide, comprising the steps of:

forming a patterned polycrystalline silicon layer on an insulating layer;

forming a titanium layer overall; and

heating the resulting structure to a temperature less than about 700° C. in an ambient comprising nitrogen to prevent silicon outdiffusion and to form titanium disilicide in the titanium layer overlying the polycrystalline layer whereby silicon nitride formation is effectively prevented.

4,545,117

METHOD OF MAKING A STATOR BAR USABLE IN A LINEAR STEPPER MOTOR

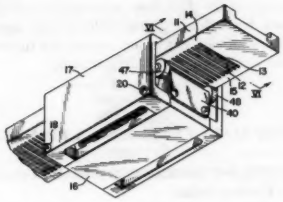
Takachiyo Okamoto, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 245,958, Mar. 20, 1981, Pat. No. 4,408,138. This application Apr. 22, 1983, Ser. No. 486,226

Claims priority, application Japan, Apr. 15, 1980, 55-50181

Int. Cl.⁴ H02K *15/06, 33/00*

U.S. Cl. 29—596 **8 Claims**



1. A method of making a stator bar usable in a linear stepper motor including

said stator bar having teeth portion along a longitudinal axis thereof, and a pair of rail portions which are provided on both sides of said teeth portion;

said teeth portion having a plurality of stator teeth transverse to said longitudinal axis, with a pitch proportional to a minimum distance of the motion of said motor; and

a slider including a plurality of rollers engagable with said rail portions, an armature formed with poles having surfaces cooperative with said teeth portion of said stator bar, and windings on said poles;

said pole surfaces having teeth with a pitch correlated to the pitch of said stator teeth and being opposite to said teeth portion of said stator bar with a predetermined small gap therebetween when said rollers engage with said rail portions;

wherein said method comprises the steps of

providing a soft steel material of predetermined size which is of a high permeability magnetic material;

cutting one surface of said material for forming uniformly spaced parallel grooes transverse to the longitudinal axis

so that on both sides of said grooves are formed a pair of flat portions usable as said rail portions; and

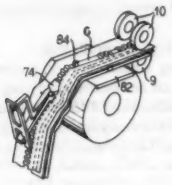
plating said material with a metallic compound so that the surface of said material is covered with a lamina which is substantially harder than said soft steel material.

4,545,118

APPARATUS FOR PRODUCING SLIDE FASTENERS FROM CONTINUOUS FASTENER CHAIN

Harry Fisher, Whitestone, and Stuart Fisher, Floral Park, both of N.Y., assignors to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 458,457, Jan. 17, 1983, Pat. No. 4,495,686.
This application Nov. 13, 1984, Ser. No. 670,809
Int. Cl.[4] B21D *51/50*
U.S. Cl. 29—768 **9 Claims**



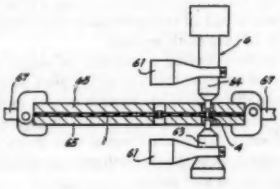
1. Apparatus for attaching sliders to a slide fastener chain having alternating longitudinal portions of engaged fastener elements and fastener element-free gaps, comprising feed means for drawing said chain in a downstream direction past a sensing means, said sensing means for detecting each said gap passing thereby and halting said feed means to position said gap in an assembly station, spreading means for transversely widening said gap and partially uncoupling upstream fastener element rows, a rotor having a slider holding means for seizing a slider, passing said slider to said widened gap, threading said slider in an upstream direction onto said uncoupled fastener element rows, and releasing said slider at corresponding positions of rotation of said rotor and, means for delivering sliders one at a time to said slider holding means.

4,545,119

METHOD OF MANUFACTURING A PRINTED CIRCUIT BOARD

Hisaji Tanazawa, 8-4, Hanazonohigashimachi 1-chome, Higashi-osaka-shi, Osaka, Japan

Filed Jan. 13, 1983, Ser. No. 457,684
Claims priority, application Japan, Jan. 14, 1982, 57-4144[U]
Int. Cl.[4] H05K *3/34*
U.S. Cl. 29—839 **9 Claims**



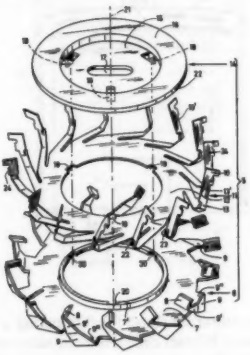
1. A method of manufacturing a printed circuit board of paper laminates impregnated with epoxy or phenolic resin having conductive patterns provided on both sides thereof and through-holes to receive electronic elements characterized by inserting conductive materials to the through-holes, bending projecting end portion of the conductive materials laterally toward conductive patterns, holding the bent end portion of the conductive material by pinching it with an ultrasonic tool at both front and rear sides of said printed board, and applying ultrasonic vibration to the contacting surface of the bent end portion of the conductive material and conductive pattern with a pressure not less than that required for fixing the end portion to said conductive patterns and not more than 500 kg/cm^2 rendering metallic contact between them, the frequency of the ultrasonic vibration being 15–80 kHz and the amplitude being 0.5–100 um.

4,545,120

SHAVING APPARATUS

Jochem J. De Vries, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,068
Claims priority, application Netherlands, Dec. 17, 1982, 8204879
Int. Cl.[4] B26B *19/42*
U.S. Cl. 30—34.2 **4 Claims**



1. A shaving apparatus having a circular shear plate provided with hair-entrance apertures and a cutting unit associated with and rotatable relative to the shear plate about an axis of rotation; said cutting unit comprising a cutting member having a circular central body, cutter arms extending from the periphery of said central body toward the shear plate, a cutter formed at the end of each cutter arm, a part of each cutter arm extending in a substantially axial direction, a hair-pulling member having a circular central portion, hair-pulling-blade arms extending from the periphery of said central portion toward the shear plate, a hair-pulling blade formed at the end of each hair-pulling-blade arm, each hair-pulling blade being associated with and movable relative to a cutter, and a part of each hair-pulling-blade arm extending in a substantially axial direction; the axially directed part of each cutter arm and the axially directed part of its associated hair-pulling-blade arm being so positioned relative to each other that the axially directed part of the cutter arm is arranged radially opposite the axially directed part of the hair-pulling-blade arm and is situated at a greater radial distance from the axis of rotation than the axially directed part for the hair-pulling-blade arm.

4,545,121
HAND-HELD POWER TOOL WITH CIRCULAR-DISK-SHAPED TOOL

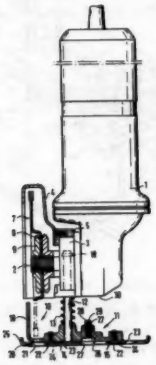
Gerhard Armbruster, Stuttgart; Fritz Schädlich, Leinfelden-Echterdingen, and Eberhard Seidel, Ostfildern, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1983, Ser. No. 521,733

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1982, 3239986

Int. Cl.⁴ B27B *9/02*

U.S. Cl. 30—374 **11 Claims**



1. A hand-held power tool, comprising a drive shaft; an output shaft extending angularly to said drive shaft; a circular-disk-shaped cutting tool element mounted on said output shaft and having an axis; and a guiding part surrounding said tool element in its immovable position at its cutting side, said guiding part having a wall arranged for abutting against a workpiece and having a through slot for said tool element, and a guiding edge which is formed as a further wall extending parallel to a cutting plane of said tool element and upwardly beyond said first-mentioned wall in direction away from a workpiece, said guiding part being movable guided in a direction normal to said wall and normal to said axis of said tool element.

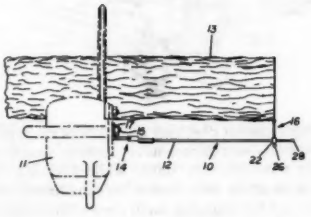
4,545,122
CHAIN SAW GAUGING ATTACHMENT

David L. Durfee, Jr., Marshall Road, Meadville, Pa. 16335, assignor to David L. Durfee, Jr., Meadville, Pa.

Filed Sep. 12, 1983, Ser. No. 530,945

Int. Cl.⁴ B27B *17/02*

U.S. Cl. 30—383 **6 Claims**



1. An axial cut gauging attachment for chain saws comprising a rod,

indicating means,

an L-shaped bracket having a first end and a second end,

an attaching means to attach said rod to said bracket,

said first end of said L-shaped bracket having an aperature therein adapted to receive an existing stud on a chain saw,

said second end of said L-shaped bracket having at least one notch therein,

said attaching means having coupling means having a recess therein adapted to receive said second end of said L-shaped bracket,

detent means on said attaching means adapted to be received in said notch for holding said rod to said bracket,

said attaching means attached to or removed from said bracket by a bracket push or pull,

said attaching means having a first part attached to said rod and a second part attached to said bracket,

pivot means connecting said first part and said second part of said attaching means together whereby said rod can be swung from a position perpendicular to the cutting plane of said chain saw and to a position parallel to said cutting plane,

spring loaded means on said first part engaging detent means on said second part for holding said rod selectively in said first position and said second position.

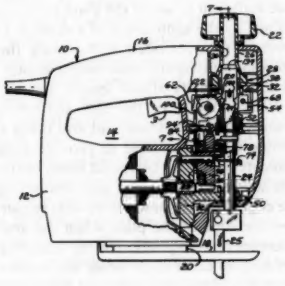
4,545,123
COMBINATION JIG SAW ADJUSTING MECHANISM

James R. Hartmann, Chicago, Ill., assignor to SKIL Corporation, Chicago, Ill.

Filed Apr. 9, 1984, Ser. No. 598,070

Int. Cl.⁴ B27B *11/02*

U.S. Cl. 30—393 **8 Claims**



1. In a power operated reciprocating saw adapted for orbital and scrolling operation, the saw comprising a housing, elongated plunger means defining a substantially vertical axis, bladeholder means on the lower end of the plunger means for mounting a saw blade in parallel relationship to the axis of the plunger and extending downwardly therefrom, lower swivel bearing means in the housing for holding the plunger for reciprocal movement generally along the vertical axis, upper swivel bearing means for holding the plunger for reciprocal movement therein, upper bearing carriage means, having the upper swivel bearing means mounted therein, affixed to the housing for pivotal movement about an axis generally transverse to the vertical axis and to an axis defined along the normal forward longitudinal cutting direction of the saw, the pivotal axis being offset from the vertical plunger axis, drive means for reciprocating the plunger means generally along the vertical plunger axis, means synchronized to the drive means for imparting oscillatory motion to the upper bearing carriage means about the pivotal axis thereby to impart orbital plunger motion, knob means rotably mounted on the housing above the plunger substantially on the vertical axis thereof, means operatively interconnecting the plunger means and knob means adapted to lock said means in fixed rotational relationship about the vertical axis and to impart rotational scrolling motion from the

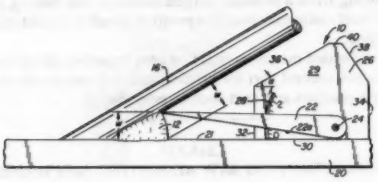
knob means to the plunger means, means for limiting the orbital motion of the plunger means, means for limiting the scrolling motion of the plunger means, mode selector means operatively connected to the means for limiting orbital plunger motion and to the means for limiting scrolling plunger motion wherein orbital or scrolling saw operation may be selected by repositioning said single mode selector means.

4,545,124

SKEWED T-FILLET WELD GAUGE

Paul S. Brooks, Martinez, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Filed Aug. 24, 1983, Ser. No. 526,173
Int. Cl.[4] G01B *5/02*
U.S. Cl. 33—169 D **5 Claims**



1. A gauge for measuring the height of a weld of a skewed T-joint when the weld is in an acute angle or an obtuse angle of the T-joint comprising:

a plate having a first reference edge and a length extending outwardly from said reference edge, said length being of a magnitude sufficient to allow the plate to be placed in the space defined by the acute angle of a skewed T-joint, said plate having a face provided with a scale thereon, said scale extending outwardly from said reference edge substantially longitudinally of said length; and

an arm pivotally mounted on the plate and extending laterally and outwardly therefrom, said arm being adjacent to and movable along said scale to provide scale readings which indicate the height of a weld when the outer end of the arm is adjacent to the weld, said arm having a second reference edge movable into side-by-side registry with the first reference edge of the plate when the arm is moved into a reference or zero position on the scale, the reference edges defining an acute angle when the second reference edge is out of said registry with said first reference edge, the maximum width of said arm being a number of times less than the length of the arm, the arm having a length sufficient to allow the arm to measure the height of a weld in the obtuse angle of a skewed T-joint.

4,545,125

EQUAL SPACING POSITIONING APPARATUS

William R. Rogers, Fremont, and Duane B. Liescheidt, White Cloud, both of Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Dec. 27, 1983, Ser. No. 565,435
Int. Cl.[4] G01M *3/00*
U.S. Cl. 33—572 **8 Claims**

1. A dud detector positioner for use with a plurality of non-destructive dud detectors of the type which are positioned above a series of containers moving along a conveyor belt, the positioner comprising:

a frame mounted above the conveyor belt including side support members;

a dud detector support assembly mounted between the side support members and overlying the conveyor belt, the support assembly including:

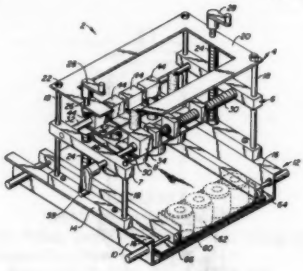
a horizontal positioning rod;

a plurality of dud detector supports configured to engage said positioning rods to be supported thereby, said dud detector supports adapted to support a dud detector;

said positioning rod having a plurality of serially arranged threaded positioning segments engaging complementary threaded portions of said dud detector supports;

said threaded positioning segments having threads according to the following:

$$N(k)=N(l)\div k.$$



where:

N(l)=the number of threads per unit length for the first threaded segment, and

N(k)=the number of the threads per unit length for the k^{th} threaded segment; and

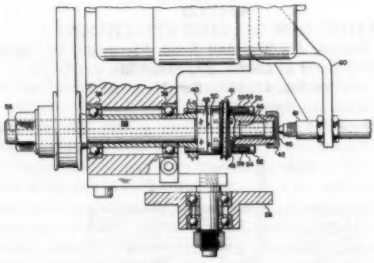
means for rotating said positioning rod thereby moving said dud detector supports and dud detector therewith in uneven amounts with said dud detectors remaining equally spaced.

4,545,126

METHOD AND APPARATUS FOR CHECKING TOOTHED ARTICLES

John C. Nielsen, Mt. Prospect, and Henry J. Flair, Franklin Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 10, 1984, Ser. No. 569,626
Int. Cl.[4] G01B *5/20*
U.S. Cl. 33—179.5 R **12 Claims**



1. An apparatus for checking an article of the type including splines and gears, said apparatus comprising means for holding said article translationally stable while allowing rotation of said article about its axis, means for simultaneously rotating said article and for engaging teeth thereof including two separated externally threaded discs, said discs being rotationally fixed and axially moveable relative to one another, a first of said discs being substantially fixed along its axis, said axis being substantially transverse to the axis of said article, a second of said discs being resiliently urged toward said first disc, said first disc being adapted to engage a tooth surface on said article.

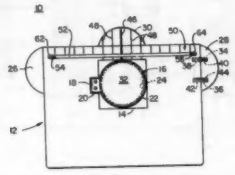
said second disc being adapted to engage a second tooth surface on said article, drive means associated with said discs for axially rotating both said article and said discs upon engagement of said discs with said article, means for detecting relative axial motion of said discs during their engagement with said article.

4,545,127

POSITIONING SYSTEM FOR EMBROIDERY HOOP

Kevin M. Barry, 167 Rolling Acres Rd., Lunenburg, Mass. 01462

Filed Aug. 14, 1984, Ser. No. 640,668
Int. Cl.[4] G01B *5/00*
U.S. Cl. 33—180 R **34 Claims**



1. A positioning system for locating a keyed embroidery hoop on a workpiece comprising: a hoop mounting plate; a hoop recess in said mounting plate shaped for receiving a keyed hoop and positioning said hoop in a predetermined orientation; a center line on said plate; and a plurality of parallel gauge lines for positioning a workpiece on said plate relative to said hoop recess.

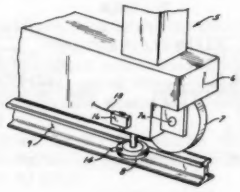
21. A positioning system for locating a keyed embroidery hoop on a workpiece comprising: a hoop mounting plate; a hoop recess in said mounting plate shaped for receiving a keyed hoop and positioning said hoop in a predetermined orientation; and at least one registration member extending from said plate.

4,545,128

APPARATUS FOR CHECKING ALIGNMENT OF TANDEM FLANGELESS MONORAIL WHEELS

Dale A. Baker, Waukesha, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Jul. 23, 1984, Ser. No. 633,613
Int. Cl.[4] G01B *3/30, 5/255*
U.S. Cl. 33—203 **4 Claims**



1. Apparatus for measuring degree of misalignment of tandem unflanged wheels of a truck that also comprises four rollers rotatable on vertical axes, two at each side of a single rail, for constraining the wheels to ride along said rail, said apparatus comprising:

A. light reflecting means on each roller, spaced from its axis and having limited circumferential extension;

B. a photoelectric sensor for each roller, each sensor being mounted on said truck in a position to detect passage of the light reflecting means on its roller as the roller rotates and being responsive to detection of each such passage to issue a predetermined number of electrical impulse outputs for each revolution of its roller; and

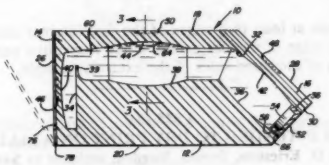
C. signalling means for each sensor, connected with the sensor to produce a perceptible output for each impulse output from the sensor, so that the number of revolutions made by each roller during a movement of the truck along the rail can be known and compared with the number of revolutions made by each of the other rollers during the same movement.

4,545,129

MULTIPOSITION LEVEL

Theodore M. Stone, P.O. Box 5215, Bakersfield, Calif. 93388

Filed Dec. 19, 1983, Ser. No. 563,178
Int. Cl.[4] G01C *9/24*
U.S. Cl. 33—390 **6 Claims**



1. A multiposition level including an elongated hollow body having a closed cavity defined therein incorporating a first elongated longitudinally extending central cavity portion, a second generally 45° angulated first end cavity portion disposed at one end of said central cavity portion and a third 90° angulated second end cavity portion disposed at the other end of said central cavity portion, said end cavity portions projecting outwardly from the same side of said central cavity portion and including inner end portions opening into the adjacent ends of said central cavity portion, said body being constructed of transparent material, a quantity of liquid disposed in and partially filling said cavity, a gas bubble in said cavity occupying the portion thereof not occupied by said liquid, a first side of said body corresponding to said same side of said cavity including a first plane outer surface, a first end of said body corresponding to said other end of said central cavity portion including a second plane outer surface disposed normal to said first surface, the side of said body opposite from said first outer surface including a third plane outer surface paralleling said first surface and a fourth plane outer surface adjacent said one end of said central cavity portion angularly displaced 45° relative to said third outer surface and paralleling said first end cavity portion, said central, second and third cavity portions including first wall portions against which said bubble is centered when said body is disposed with said first, second and fourth outer surfaces, respectively, horizontally disposed, said first wall portions comprising concave partial spherical wall portions, said second, third and fourth outer surfaces include indicia thereon indicating the centered positions of said bubble against the corresponding first wall portions.

4,545,130

DESIGNER'S TRIANGLE

Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045

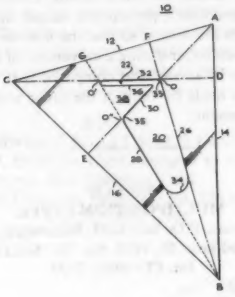
Filed Aug. 22, 1983, Ser. No. 525,605
Int. Cl.[4] B43L *13/00*
U.S. Cl. 33—474 **29 Claims**

1. A designer's triangle comprising:

an external triangle of generally planar sheet material;

a plurality of internal edges defining an internal cutout in the

form of a first internal triangle and a slot connected therewith;



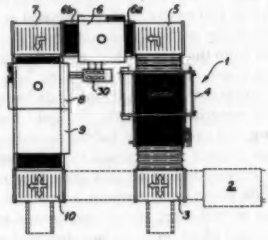
wherein at least two edges of the first internal triangle and one edge of the slot extend along respective perpendiculars of the three sides of the external triangle.

4,545,131

DRIER INTENDED TO DRY PRINT ON A MATERIAL

Sylve J. D. Ericsson, Tumba, Sweden, assignor to Svecia Silkscreen Maskiner AB, Norsborg, Sweden

Filed Mar. 17, 1983, Ser. No. 476,272
Claims priority, application Sweden, Mar. 17, 1982, 8201690
Int. Cl.⁴ F26B *23/04*
U.S. Cl. 34—4 **8 Claims**



1. A drier device for drying print applied on a material according to a pattern, said drier device comprising a conveyor means for moving the material to and from the drier device at a high speed sequence, a plurality of drying units, each drying unit comprising a plurality of drying elements for drying print applied to the material, control means for activating a number of drying elements according to the pattern of the applied print, and means for moving the material along a path passing adjacent said drying units in a slow speed sequence during the period of activation of the number of elements, said elements being aligned parallel with said path, said units extending across said path.

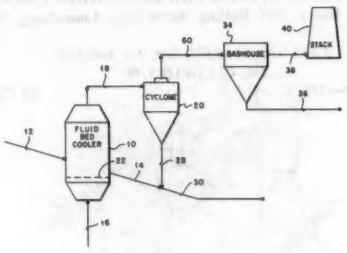
4,545,132

METHOD FOR STAGED COOLING OF PARTICULATE SOLIDS

Ying H. Li, Tucson, Ariz., and Bernard F. Bonnecaze, Littleton, Colo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 6, 1984, Ser. No. 597,319
Int. Cl.⁴ F26B *7/00*
U.S. Cl. 34—20 **34 Claims**

1. In a method for cooling particulate solids including finely divided solids in an expanded bed of said solids, said expanded bed being supported above a support means in a cooling vessel by flowing a cooling gas upwardly through said expanded bed at a velocity sufficient to maintain said expanded bed in an expanded condition and for a time sufficient to cool said solids to a selected temperature, the improvement comprising: cooling said solids to said selected temperature by successively charging said solids to a plurality of expanded beds wherein finely divided solids are entrained from said plurality of expanded beds with the exhaust gas from each expanded bed and



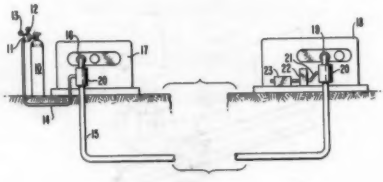
recovered and combined with the cooled solids recovered from said expanded bed and wherein the exhaust gas from each of said plurality of expanded beds is discarded, the total bed area of said plurality of expanded beds being less than the bed area required in a single expanded bed for cooling said solids to said selected temperature and the total amount of cooling gas required in said plurality of expanded beds being less than the amount of cooling gas required in a single expanded bed for cooling said solids to said selected temperature.

4,545,133

APPARATUS AND METHOD FOR PROLONGING THE SERVICE LIFE OF ELECTRICAL POWER CABLES

Bogdan Fryszczyn, South Plainfield, N.J.; George Bahder, deceased, late of Edison, N.J., and Alice Bahder, legal representative, Edison, N.J., assignors to American Public Power Association, Washington, D.C.

Filed Apr. 20, 1984, Ser. No. 602,506
Int. Cl.⁴ F26B *3/06*
U.S. Cl. 34—21 **14 Claims**



1. A method for flushing moisture from the insulation of a electrical cable having a center conductor to thereby retard decomposition of the insulation, said method comprising the steps of:

forming a passageway through the cable insulation to said conductor at a first point along the cable; and

continuously introducing into said passageway for the service life of the cable a dry fluid at a pressure in the range of 1–50 p.s.i., wherein said dry fluid flows along the length of said conductor and out through the cable insulation to thereby flush moisture from the insulation.

4,545,134

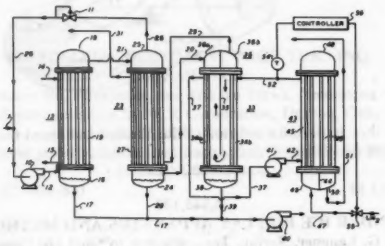
DUAL VESSEL HEAT EXCHANGE SYSTEMS

Ajit K. Mukerjee, Whitehall, Pa.; Patrick J. Kearns, Washington, and Davis J. Rieman, Paramus, both of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Continuation of Ser. No. 481,177, Apr. 1, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,480

Int. Cl.⁴ F26B *3/04*

U.S. Cl. 34—27 **13 Claims**



1. A method of recovering solvent vapor from an inerted oven during curing of a solvent borne resin coating on a web passing therethrough while maintaining a mass balance between inert gas flows in and out of said oven comprising the steps of:

withdrawing oven atmosphere comprising inert gas and solvent vapor and supplying said withdrawn atmosphere to a first heat exchanger;

condensing all but trace amounts of solvent vapor supplied to said first exchanger by indirect heat exchange with an intermediate refrigerant medium different from the liquid phase of said inert gas and returning a stream comprised of inert gas and trace solvent vapor to said oven at substantially the same flow rate at which inert gas is removed from the oven;

supplying said intermediate heat exchange medium to a second heat exchanger and chilling said medium therein by indirect heat exchange with the liquid phase of said inert gas to thereby vaporize said liquid phase; and

forming one or more inert gas curtains exteriorly of the oven in the vicinity of the web entrance and exit of the oven by supplying said vaporized liquid phase to said vicinity without mixing said vaporized liquid phase with said stream returned to said oven prior to forming said gas curtains.

4,545,135

INSTALLATIONS FOR SPIN-DRYING FIBROUS OR POROUS MATERIALS

B. Barriquand; F. Villard, both of Roanne; M. Martin; M. Tridon, both of Lyons, and M. Pignal, Annonay, all of France, assignors to Barriquand, Roanne and Robatel, Genas, both of, France

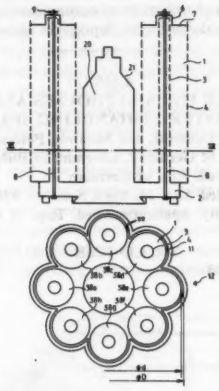
Filed Apr. 27, 1983, Ser. No. 489,121

Claims priority, application France, Apr. 29, 1982, 82 07407; Feb. 25, 1983, 83 03123

Int. Cl.⁴ F26B *11/08*

U.S. Cl. 34—58 **35 Claims**

1. In an installation for the centrifugal spin-drying of fibrous or porous materials which comprises, in combination, a spin-drier and a material carrier for receiving at least one pile of spools of fibrous or porous materials said material carrier formed from a plurality of supports each adapted to receive a pile of spools, disposed along at least one ring about a common axis formed by a central caisson, said spin-drier being equipped with a basket for receiving said material carrier, said basket comprising a plurality of pocket means each adapted to receive a pile of spools carried by a support of the material carrier, said supports being adapted to be each housed in a pocket means of the basket of said spin-drier and the common axis about which said supports are disposed in a ring is formed by a hollow



central caisson adapted to fit onto a central pivot of the centrifugal spin-drier.

4,545,136

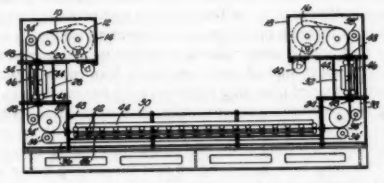
ISOLATION VALVE

Masatsugu Izu, Birmingham, and David A. Gattuso, Pontiac, both of Mich., assignors to Sovonics Solar Systems, Solin, Ohio

Continuation of Ser. No. 444,923, Nov. 26, 1982, abandoned, which is a continuation of Ser. No. 244,385, Mar. 16, 1981, abandoned. This application Nov. 3, 1983, Ser. No. 548,396

Int. Cl.⁴ F26B *13/02*

U.S. Cl. 34—155 **6 Claims**



1. A valve for use in a vapor deposition system (1) which is closed to atmospheric conditions and (2) wherein a substrate is adapted to sequentially travel through a plurality of operatively interconnected chambers for the successive deposition of semiconductor layers thereonto; each chamber of said system including:

spaced entrance and exit apertures through which said substrate travels; means for maintaining chamber pressures substantially below atmospheric pressure; means for introducing different reaction gas mixtures including at least one semiconductor material into adjacent deposition chambers; and means for the vapor deposition of semiconductor material of differing conductivity types in each adjacent chamber;

a valve adapted to extend between the entrance aperture of a succeeding chamber and the exit aperture of a preceding chamber for providing the operative interconnection between said adjacent deposition chambers: each valve having an opening communicating with the apertures of said adjacent deposition chambers and through which said substrate material passes, the width of said opening being at least equal to the width of said substrate material;

means for introducing an inert gas along substantially the

entire width of said opening of said valve whereby an inert gas curtain is formed in the opening which substantially isolates the reaction gases in said adjacent deposition chambers and prevents the reaction gas mixture in one deposition chambers from contaminating the reaction gas mixture in the adjacent deposition chamber.

4,545,137

HURDLE FOR MALTHOUSES AND OTHER MATERIAL-HANDLING SPACES

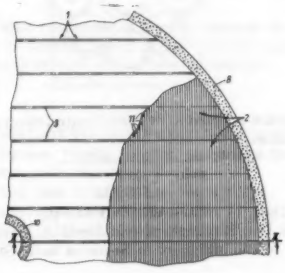
Kurt Amelung, Denstorf, and Manfred Peters, Brunswick, both of Fed. Rep. of Germany, assignors to Bühlwe-Miag GmbH, Brunswick, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 526,165

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1982, 3232977

Int. Cl.⁴ F26B *19/00*

U.S. Cl. 34—233 **3 Claims**



1. A hurdle for malthouses and other material-handling spaces, comprising a supporting frame; and a bottom supported by said supporting frame and permeable for passage of a material treating medium, said bottom including a plurality of hollow sheet shaped members which extend parallel closely near one another and are self-supporting and provided with a plurality of through openings, and connecting means for connecting said hollow sheet shaped members with one another, said hollow sheet shaped members being formed as downwardly open U-shaped clamping members each having flanges extending and converging downwardly, each of said flanges having a free end and being provided at its free end with an inwardly extending arresting strip, said connecting means being formed as clamping rails supported on said supporting frame, each of said clamping rails being formed as an angular shaped member having one leg which lies on said supporting frame and has at its free end an upwardly extending projection pair arranged so that a distance between said projection pairs corresponds to the width of said clamping shaped members, each of said projection pairs including two projections provided at their inwardly facing sides with arresting grooves each receiving a respective one of said arresting strips of said clamping shaped members.

4,545,138

REUSABLE TYING DEVICE

Ronald D. Blum, Roanoke, Va., assignor to Tie-Tite Products, Inc., Roanoke, Va.

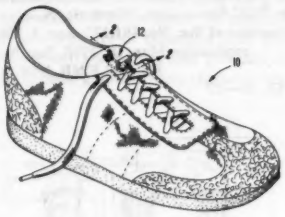
Continuation-in-part of Ser. No. 552,382, Nov. 16, 1983, abandoned. This application May 4, 1984, Ser. No. 607,258

Int. Cl.⁴ A43B *11/00*; **F16G** *11/00*

U.S. Cl. 36—51 **26 Claims**

6. A shoe with a tongue and lace as comprising:

an elastic band having a distal end and a proximate end, said distal end being secured to means for securing said band to the tongue of a shoe above the position where shoe laces are normally tied; said proximal end of said elastic band being secured to a medallion, said medallion having a surface for portraying a pictorial work; and means for releasably securing said proximate end to a portion of the



shoe to permit extension of the elastic band about the knot of tied laces.

4,545,139

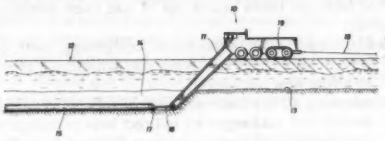
UNDER ICE PIPELAY APPARATUS AND METHOD

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 30, 1984, Ser. No. 676,744

Int. Cl.⁴ E01H *4/00*; **E02F** *3/90*

U.S. Cl. 37—197 **5 Claims**



1. A method for excavating a trench into a seabed beneath a floating ice sheet and for placing a pipeline in the trench, comprising:

simultaneously cutting a slot in the ice and excavating the trench with a travelling cutter;

supporting the cutter and controlling its longitudinal movement from on top of the ice; and

pulling the pipeline in the trench with the cutter.

4,545,140

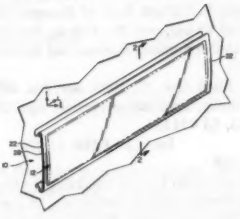
GRAPHIC STAGING DEVICE

Jeffery M. Winston, 250 Eden's Rd., Anacortes, Wash. 98221

Filed Feb. 21, 1984, Ser. No. 582,180

Int. Cl.⁴ G09F *3/18*

U.S. Cl. 40—10 D **20 Claims**



1. A graphic staging device for displaying substantially two-dimensional graphics of generally planar configuration in at least a slightly arcuate presentation and for protecting the same from ambient exposure, comprising first and second staging members of formed polymeric webs each having substantially the same configuration, said webs being of generally rectilinear form and including a central, slightly arcuate field

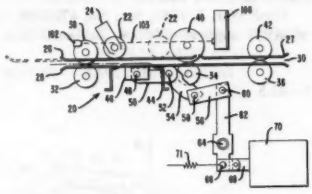
within a panel surrounded by a raised peripheral bead merging along longitudinal edges to inwardly directed flange members having a reentrant cross section with one of said flange members further including a return leg as a continuous extension thereof to yield a fin bearing adhesive for securing said member to a support, said flange and fin comprising hinge means for said staging member; said graphic staging device being deployed with said staging members disposed in transversely mirror-imaged interengagement with said flanges in cooperative association constituting latching means therefor.

4,545,141

AUTOMATIC DOCUMENT PAGE TURNING APPARATUS

Masakazu Ito, Hiratsuka, and Hikaru Izawa, Yokohama, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 24, 1984, Ser. No. 653,813
Claims priority, application Japan, Sep. 30, 1983, 58-180963
Int. Cl.⁴ G09F *13/00*
U.S. Cl. 40—531 **14 Claims**



7. A document page turning apparatus comprising;
a plurality of plate members forming a guide chute for supporting a multiple-page document along a feed path;
a plurality of first feed rollers positioned adjacent the guide chute for feeding the documents along the feed path to a turning station;
a drive member positioned adjacent a guide chute and mounted for movement in a direction to engage and move a document positioned at the turning station to a bowed configuration when actuated;
means for actuating said drive member when operated;
a second feed roller positioned adjacent said guide chute opposite said drive member for engaging the top page member of the document upon movement of the document to a bowed configuration;
means for rotating said second feed roller when operated whereby the second feed roller will rotate the top page member to a partially open position;
and control means for operating said first feed rollers to move a document along the feed path toward the second feed roller whereby said second feed roller will move the top page number to an open position.

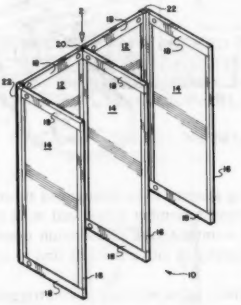
4,545,142

DISPLAY FRAMING APPARATUS

Hubert E. Whisnant, 617 E. 28th St., Charlotte, N.C. 28205

Filed Jan. 3, 1984, Ser. No. 567,768
Int. Cl.⁴ G09F *7/00*
U.S. Cl. 40—605 **9 Claims**

1. A display framing apparatus for repeated temporary uses comprising two frame members and assembly means for quick connection and disconnection of said frame members, said assembly means including means on one said frame member defining an outwardly opening channel, means defining an interior cavity in the other frame member at one end thereof, a pair of opposed jaw members arranged within said interior cavity in said other said frame member and having respective engaging end portions extending outwardly from said open end of said other frame member, said jaw members being pivotally connected to one other at a spacing from their end portions for relative pivotal movement thereof toward and away from one another between a released position wherein said end portions of said jaw members are disposed relatively adjacent one another for insertion into and removal from said channel and an engaged position wherein said end portions of said jaw members are disposed relatively spaced from one another for gripping engagement interiorly of said channel defining means, said jaw members having opposed facing surfaces which are compatibly configured to define an operating area between said jaw members, a jaw operating member slidably disposed in said area and compatibly profiled with said facing surfaces of said jaw members for sliding movement of said jaw operating member in said area toward and away from the pivot axis of said jaw members between a jaw releasing position wherein said jaw operating member is substantially contained within said operating area for permitting said end portions of said jaw members to move substantially together to their said released position and a jaw engaging position wherein said jaw operating member extends outwardly be-



tween said engaging portions of said jaw members in wedged engagement therewith for moving said end portions of jaw members to and for maintaining them in their said engaged position, said other frame member having an opening therethrough adjacent said interior cavity therein, and a control member affixed integrally to said jaw operating member for unitary sliding movement therewith toward and away from the pivot axis of said jaw members, said control member extending outwardly through said opening to the exterior of said other frame member and said opening being of an enlarged dimension relative to said control member for permitting selective manual movement of said control member in said opening toward and away from the pivot axis of said jaw members to actuate corresponding unitary sliding movement of said jaw operating member between its said jaw releasing and jaw engaging positions, whereby connection and disconnection of said frame members is accomplished rapidly and without tools essentially only by manual sliding movement of said control member.

4,545,143

TRIGGER MECHANISM FOR DOUBLE BARREL SHOTGUN

Mitchell D. Schultz, 57 Unquowa Rd., Fairfield, Conn. 06430

Filed Oct. 24, 1983, Ser. No. 545,046
Int. Cl.⁴ F41C *7/00, 19/00*
U.S. Cl. 42—42 R **5 Claims**

1. A double barrelled shotgun comprising:
two hammers, one for firing each barrel,
a spring urging each hammer from a cocked to a fired position,
sear means for holding each hammer in a cocked position associated with each of said hammers, and
manually-operable pivoted trigger means for successively actuating said sear means associated with each of said

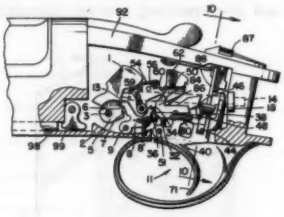
hammers to successively release each hammer to fire the same, said trigger means including

fixed selector means for firing one of said barrels by contact with one of said sear means to transmit motion from said trigger means, when pivoted, to disengage said sear means from its associated hammer and permit its associated spring to urge said hammer to a fired position,

an inertia-operated mass pivotally mounted on said trigger means,

spring means urging said mass from a first position initially out of engagement with the other of said sear means to a second position in engagement with the other of said sear means,

a spring-operated engagement member biasing said mass for resiliently holding said mass in its first position,



said mass being adapted to be disengaged automatically from said engagement member when said mass is subjected to recoil and counter-recoil acceleration upon firing of the shotgun, thereby to move from its first to its second position, and

cam means which upon pivoting of said trigger means froms an obstruction in the path of movement of said mass to assure disengagement of said engagement member and said mass upon the initial firing of said shotgun and movement of said mass from its first to its second position,

said mass when in its second position, being movable, upon successive operation of said trigger means to disengage said other sear means from its associated hammer thereby causing firing of said second barrel.

4,545,144

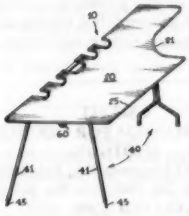
SHOOTERS TABLE

Philip C. Schuster, P.O. Box 1523, Ft. Collins, Colo. 80522

Filed Jul. 16, 1982, Ser. No. 399,070

Int. Cl.[4] F41C *29/00*

U.S. Cl. 42—94 **6 Claims**



1. A new and improved construction for shooting tables comprising:

a generally elongated rectangular horizontal support surface having;

an enlarged recess formed therein;

at least one elongated aperture disposed proximate an edge of the support surface; wherein, the said at least one elongated aperture forms a carrying handle for said shooting table;

at least one smaller recess formed along an edge of the support surface wherein said at least one smaller recess is dimensioned to receive a firearm used in conjuction with the shooting table, whereby the firearm will be supported in a generally vertical position with respect to said shooting table;

a continuous raised portion extending around at least a substantial portion of the periphery of the support surface; whereby rounded objects placed on the support surface will be prevented from rolling off said support surface; and

a plurality of vertical support members pivotally connected to the underside of the horizontal support surface.

4,545,145

LIQUID TRANSFER DEVICE

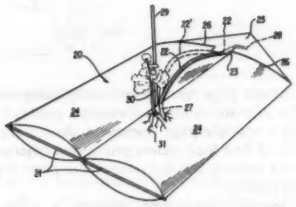
Donald M. Torrance, Gladstone Rd., Masterton, New Zealand, assignor to Donald MacNeil Torrance and Mathew Barbour, both of Masterton, New Zealand

Filed Mar. 3, 1983, Ser. No. 471,748

Claims priority, application New Zealand, Mar. 3, 1982, 199893

Int. Cl.[4] A01G *29/00*

U.S. Cl. 47—48.5 **4 Claims**



1. An automatic and controllable liquid supply apparatus comprising a liquid reservoir for containing a predetermined volume of liquid and a liquid transfer means comprising an elongate tubular member of a liquid impermeable material containing a continuous length of an absorbent or hydrophilic material extending between liquid inlet and liquid outlet end portions of said tubular member, said liquid inlet end portion providing contact between said absorbent or hydrophilic material and said liquid in said reservoir so that liquid can be transferred by said absorbent or hydrophilic material to said liquid outlet portion, the reservoir comprising an elongate liquid-fillable bag having a spout or port section which the liquid inlet end portion of said liquid transfer means is inserted, said bag being folded to form a pair of liquid containing legs said legs lying underneath said port section and arranged mutually parallel and mutually engageable so as to be capable of encompassing and supporting a single tree or shrub therebetween, said liquid outlet end portion of said liquid transfer means being insertable into the ground in the root zone of said single tree or shrub to feed said liquid thereto.

4,545,146

ROUTE TO HYBRID SOYBEAN PRODUCTION

William H. Davis, Hale Center, Tex., assignor to Ring Around Products, Inc., Dallas, Tex.

Filed Mar. 5, 1984, Ser. No. 585,940

Int. Cl.[4] A01H *1/02*

U.S. Cl. 47—58 **86 Claims**

1. A process for the efficient production of seeds capable of growing male fertile F_1 hybrid *Glycine max* plants comprising:

(a) growing a substantially uniform population of male sterile soybean plants wherein said male sterility is attributa-

ble to the combination of an atypical Cms cytoplasm and two distinct pairs of recessive genes r_1r_1 and r_2r_2 in pollinating proximity to a substantially uniform population of male fertile soybean plants which possess at least one pair of dominant genes selected from the group consisting of R_1R_1 and R_2R_2 and which when crossed with said male sterile soybean plants enable the formation of seeds on said male sterile soybean plants which are capable of growing male fertile F_1 hybrid soybean plants,

(b) crossing said male sterile soybean plants and said male fertile soybean plants whereby seeds are formed on said male sterile soybean plants, and

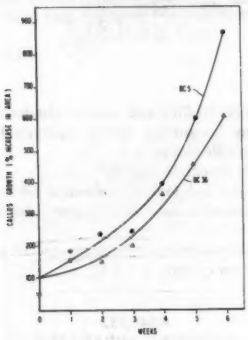
(c) selectively recovering the seeds which have formed on said male sterile soybean plants.

4,545,147

ASEXUAL EMBRYOGENESIS OF CALLUS FROM *THEOBROMA CACAO* L.

Jules Janick, and Halina M. Kononowicz, both of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 8, 1983, Ser. No. 521,077
Int. Cl.[4] A01G *1/00*
U.S. Cl. 47—58 **9 Claims**



1. A non-agricultural method for the production of cacao embryos comprising the steps of:

(a) growing immature asexual or zygotic cacao embryos on a first basal medium until cotyledonary tissue which includes callus is produced;

(b) separating the pre-determined embryogenic callus from the said cotyledonary tissue;

(c) growing said callus on a second basal medium in the presence of a growth enhancer and continuing said callus growth through initiation and proliferation of cacao embryos.

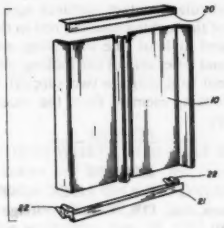
4,545,148

WEATHERSHIELD AND SAFETY SCREEN FOR OPENING WINDOWS IN BUILDINGS

Lendon J. Shaw, 5 Rikara Pl., French's Forest, New South Wales, 2086, Australia

Filed Jun. 23, 1983, Ser. No. 507,162
Claims priority, application Australia, Jun. 25, 1982, PF4592
Int. Cl.[4] E06B *7/00*
U.S. Cl. 49—50 **7 Claims**

1. A shield rigidly vertically installed within a window cavity of a building in which at least a portion of the window is openable, the shield comprising: a substantially rectangular planar sheet of plastics material extending vertically the height of the open window and horizontally at least across part of the openable portion of said window, the sheet includes moulded transverse edge strips bent in opposing directions out of the



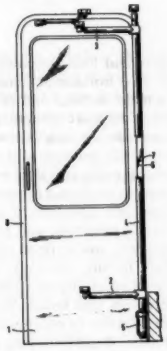
plane of the sheet; and upper and lower attachment means fastened to the structure within the window cavity.

4,545,149

DEVICE FOR SECURING THE LOCKED POSITION OF A MOTOR-VEHICLE DOOR

Wolfgang Jentsch, Niestetal-Heiligenrode, Fed. Rep. of Germany, assignor to Gebr. Bode & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Jan. 3, 1984, Ser. No. 567,474
Int. Cl.[4] E05F *7/02*
U.S. Cl. 49—255 **5 Claims**



1. In a door assembly having a frame, swinging door activated by a rotatable post, with the door being locked and unlocked by raising and lowering the post, and means for securing the door in the locked position including a disk attached to the bottom of the post, a rotatable support for the disk comprising a double-armed lever, means mounting the support below the disk on a stationary section of the frame for displacement into a first position in which the disk rests on a top portion of one of the lever arms, the improvement wherein, the securing means further comprises: means mounting the support to dispose the axis of rotation thereof in a plane that is perpendicular to the direction in which the rotating post is raised and lowered, spring means urging the support into the first position, stop means on the frame, for contacting a bottom portion of the other lever arm of the support urged into the first position by the spring means, a recess in a bottom portion of the one arm of the support, a rotatable locking element comprising a double-armed lever with two support surfaces on a first lever arm, engaging the recess, means mounting the locking element to dispose the axis of rotation thereof parallel to the axis of rotation of the support, the support surfaces of the first arm are adjacent and substantially perpendicular to each other, with one surface extending substantially radially to the

axis of rotation of the locking element and the other surface extending substantially, tangentially to the direction of rotation of the locking element, the recess in the support has two adjacent and perpendicular contact surfaces against which the support surfaces of the locking element rest in the first position of the support, and at least one activating mechanism connected to the second lever arm of the locking element to rotate the locking element to disengage two support surfaces of the first arm of the locking element from the recess in the other arm of the support.

4,545,150

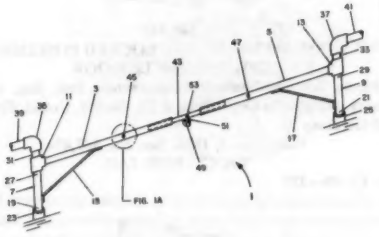
COMBINED GATE AND LOCK ASSEMBLY

Richard B. Williams, Apt. 11B, Mohawk Village Apts., Amsterdam, N.Y. 12010

Filed Nov. 20, 1984, Ser. No. 609,713

Int. Cl.[4] E05C *7/04*

U.S. Cl. 49—366 **2 Claims**



1. A combined gate and lock assembly comprising sleeves, vertical posts, tees, two horizontal female members, pintles, support structure, a male member and cross pins; said sleeves, vertical posts, pintles, support structure and male member being of tubular construction, said sleeves being fixed to or otherwise imbedded in the ground, said vertical posts having distal ends and proximal ends, said sleeves receiving said distal ends of said vertical posts in pivotal mounting relationship, said tees being fixed to said proximal ends of said vertical posts and to said horizontal female members, said pintles being vertically upstanding from said tees and in fixed relationship therewith, said support structure having openings, said openings of said support structure freely receiving said pintles in pivotal mounting relationship therewith, said female members freely receiving therein said male member in reciprocable relationship; said combined gate and lock assembly having a closed position and an open position: in said closed position, said horizontal female members being axially aligned and coaxially receiving therein said male member, and in said open position, said male member being disengaged and cleared from operative engagement with one of said female members; said female members carrying said cross pins, said cross pins functioning as limit stops to limit the extent to which said male member can be reciprocated within said female members.

4,545,151

GEAR GRINDING MACHINE INCLUDING A DOUBLE-CONE SHAPED GRINDING WHEEL

Peter Bloch, Mutschellen; Meinrad Donner, Nuolen, and Roman Schwaighofer, Geroldswil, all of Switzerland, assignors to Maag Gear-Wheel and Machine Company Limited, Zürich, Switzerland

Filed Dec. 16, 1983, Ser. No. 562,083

Claims priority, application Switzerland, Dec. 24, 1982, 7542/82

Int. Cl.[4] B24B *47/14*

U.S. Cl. 51—52 R **7 Claims**

1. A gear grinding machine operating with a double-cone shaped grinding wheel, comprising:

axial drive means for axially displacing said grinding wheel in order to perform material removal operations and tooth flank correcting operations;

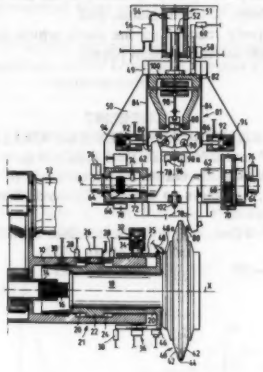
said axial drive means comprising a double-acting hydraulic piston-cylinder unit;

a grinding wheel spindle for supporting the grinding wheel;

a spindle sleeve provided for said grinding wheel spindle;

a carrier sleeve cooperating with said spindle sleeve;

said hydraulic piston-cylinder unit comprising a piston provided at said spindle sleeve and a cylinder provided at said carrier sleeve;



a servo-valve controlling said piston-cylinder unit;

a displacement measuring device operatively associated with said spindle sleeve;

a displacement detection circuit;

said servo-valve and said displacement measuring device being connected to said displacement detection circuit; and

a program control operatively connected to said displacement detection circuit.

4,545,152

GRINDING APPARATUS

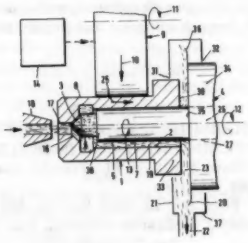
Hans Grimm, Esslingen/Berkheim, Fed. Rep. of Germany, assignor to Maschinenfabrik Gehring, GmbH & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,589

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208536

Int. Cl.[4] B24B *15/02*

U.S. Cl. 51—103 R **14 Claims**



1. Grinding apparatus for the precision machining of an internally formed sealing surface of a generally cylindrical workpiece, comprising:

(a) a grinding spindle, and means for rotating said spindle in a first direction,

(b) a grinding pin rigidly secured to said spindle, the diameter of said pin being smaller than the diameter of said spindle,

(c) a grinding tool carried on the free end of said pin and adapted to engage and grind the valve seat or sealing surface,

(d) said workpiece being positioned over said pin in direct supporting engagement therewith, the internal diameter of said workpiece being greater than the diameter of said pin whereby said pin is located eccentrically in the bore of said workpiece, the longitudinal positioning of said workpiece relative to said pin being such that the leading end of said tool can engage the surface of said workpiece during the grinding operation,

(e) holding and driving means engaging the outer surface of said workpiece for pressing the same against said pin and rotating the same in a second direction opposite to the direction of rotation of said spindle and pin carried thereby, and wherein

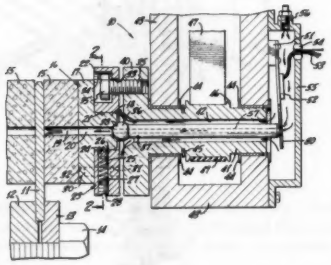
(f) said spindle is located outside the bore of said workpiece.

4,545,153

FORCE SENSOR FOR CONTROLLING POLISHING PAD PRESSURE

David A. Miller, Tustin; Leland R. Krueger, Costa Mesa, and Richard J. Charlton, South Laguna, all of Calif., assignors to Charlton Associates, Irvine, Calif.

Filed Dec. 12, 1983, Ser. No. 560,417
Int. Cl.[4] B24B *7/04*
U.S. Cl. 51—118 **2 Claims**



1. An apparatus for controlling and equalizing the forces exerted by first and second polishing members on opposite sides of a material being polished comprising:

first and second rotary polishing members for engaging opposite sides of said material;

first and second means for supporting said first and second polishing members, respectively, for rotary and axial movement;

first and second housing means;

first and second means mounted in said first and second housing means, respectively, and connected to said first and second supporting means, respectively, for rotatively driving said polishing members;

first and second means positioned between said first and second housing means, respectively, and said first and second polishing members, respectively, for applying axial forces to said polishing members;

first and second transducer means operatively coupled to said first and second force applying means, respectively, for sensing the forces applied by said force applying means to said polishing members and for generating first and second electrical signals, respectively, proportional thereto; and

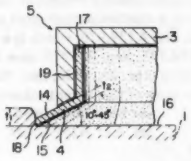
means responsive to said first and second transducer means for moving said first and second housing means axially to control the forces exerted by said polishing members upon said material, said moving means moving said housing means axially to equalize the forces exerted by said first and second polishing members on opposite sides of said material.

4,545,154

GRINDING WHEEL FOR FLAT PLATES

Shinji Sekiya, Tokyo, and Takatoshi Ono, Nagareyama, both of Japan, assignors to Disco Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 212,305, Dec. 3, 1980, Pat. No. 4,411,107. This application Aug. 15, 1983, Ser. No. 523,825
Claims priority, application Japan, Feb. 1, 1980, 55-10888; Feb. 1, 1980, 55-10889
The portion of the term of this patent subsequent to Oct. 25, 2000, has been disclaimed.
Int. Cl.[4] B24B *5/00*
U.S. Cl. 51—209 R **7 Claims**



1. A grinding wheel for grinding the flat surface of a hard and brittle material comprising a cup rotatable about an axis substantially perpendicular to the flat surface to be ground and at least one annular grindstone attached to the open end of said cup for rotation therewith, said grindstone having a thin annular grinding portion, said grinding portion protruding radially outwardly away in a separate manner from the open end of said cup with inclination relative to said axis, said grinding wheel being positioned so that the outer edge of said grinding portion can interfere with the flat surface to be ground, the hard and brittle material and said grinding wheel being adapted to be relatively movable in a direction substantially parallel to the flat surface to be ground whereby the flat surface is ground in a cutting manner, a plurality of said grindstones being axially stacked one on top of the other in fixed coaxial relationship with spacing means being provided between said grindstones so that the outer edges of said grinding portion of said grindstone are axially spaced-apart, said grinding portions of said grindstones being of progressively increasing outer diameter from the grindstone furthest from the cup toward the grindstone closest to the cup so that the outer edges of the grinding portions of said grindstones are radially spaced from each other.

4,545,155

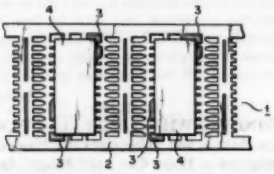
METHOD FOR REMOVING FLASHES FROM MOLDED RESIN PRODUCT

Junji Nakata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 12, 1983, Ser. No. 522,735
Claims priority, application Japan, Aug. 20, 1982, 57-143313
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—320 **9 Claims**

1. A method for removing resin flashes formed during mold-

ing of a workpiece by wet blasting, wherein a slurry comprising a synthetic resin abrasive, water and a non-ionic surfactant



containing no trace of metal ions, halogens, ammonia, phosphorus and sulfur is blasted onto the workpiece.

4,545,156

UNIVERSAL ABRASIVE CLEANING APPARATUS

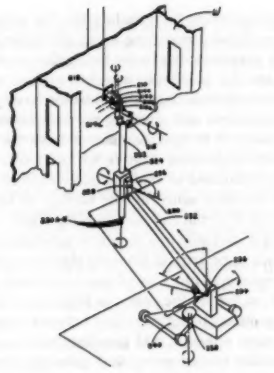
Wayne B. Hockett, 5103 S. Westshore, Tampa, Fla. 33611

Continuation of Ser. No. 353,391, Mar. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 180,804, Aug. 25, 1980, which is a continuation-in-part of Ser. No. 13,736, Feb. 21, 1979, which is a continuation-in-part of Ser. No. 746,493, Dec. 1, 1976, Pat. No. 4,139,970, which is a continuation-in-part of Ser. No. 614,191, Sep. 7, 1975, now Re. 30,289. This application Apr. 26, 1984, Ser. No. 604,391

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.[4] B24C *3/00*

U.S. Cl. 51—410 **5 Claims**



1. An apparatus for spraying a work surface with a material under pressure from a remote control source of material and pressure, comprising in combination:

a base;

a housing; a drum rotatably mounted in said housing; means for connecting said housing to said base; means for supporting rotational movement to said drum; a first arm having a channel disposed therein along the length of said first arm;

a first means for rotatably mounting said first arm relative to said base enabling said first arm to rotate about a first axis of rotation; said first means including;

a first actuator means for rotating said first arm about said first axis of rotation;

a seond arm having a channel disposed therein along the length of said second arm;

a second axis means for rotatably mounting said second arm to said first arm enabling said second arm to rotate about a second axis of rotation;

said second means including;

a second actuator means for rotating said second arm about said second axis of rotation;

an actuator control means for independently controlling each actuator means;

means for connecting said first mounting means to said drum;

a third means for rotatably mounting said first arm relative said base about a third axis of rotation;

said third axis of rotation being disposed substantially perpendicular to said first axis of rotation;

a nozzle; a nozzle support for supporting said nozzle; means for connecting said nozzle support to said arm; conduit means connecting said nozzle to the remote source of material and pressure; and said conduit means running from second nozzle through said channels disposed in said arms to the remote source of material and pressure.

4,545,157

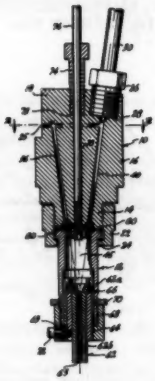
CENTER FEEDING WATER JET/ABRASIVE CUTTING NOZZLE ASSEMBLY

Albert C. Saurwein, Auburn, Wash., assignor to McCartney Manufacturing Company, Baxter Springs, Kans.

Filed Oct. 18, 1983, Ser. No. 541,826

Int. Cl.[4] B24C *5/04*

U.S. Cl. 51—439 **3 Claims**



1. A nozzle assembly for use in abrasive cutting, comprising:

an upper body which has an abrasive inlet and abrasive outlet formed in said upper body, and an abrasive conduit joining said abrasive inlet to said abrasive outlet within said upper body;

a fluid inlet formed in said upper body;

a plurality of fluid outlets formed in said upper body surrounding said abrasive outlet;

a manifold formed in said upper body in fluid communication with said fluid inlet and all of said fluid outlets;

a lower body having a mixing chamber formed therein;

a plurality of jewel-mount orifices formed in said lower body in fluid communication with said mixing chamber, each of said jewel-mount orifices being associated with and in fluid communication with one of said fluid outlets, and an abrasive orifice formed in said lower body in fluid communication with said abrasive outlet and said mixing chamber;

a plurality of jewels, each jewel associated with and mounted in one of said jewel-mount orifices, each of said jewels having a stream-forming aperture formed therethrough in fluid communication with its associated jewel-mount orifice; and

nozzle exit means mounted in said lower body, said exit

means including an exit passageway in fluid communication with said mixing chamber; wherein

said upper and lower bodies are separate structures, said nozzle assembly further including locking means associated with said upper and lower bodies to hold said upper and lower bodies in close contact; and

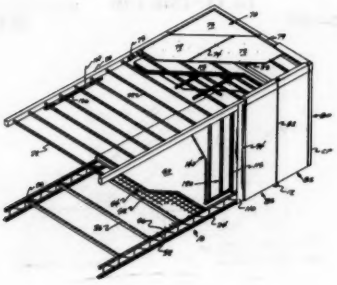
said upper body is substantially cylindrically shaped and has a lower mating surface and said lower body is substantially cylindrically shaped and has an upper mating surface congruent to said lower mating surface of said upper body, said abrasive outlet and said fluid outlets being formed in said lower mating surface and said abrasive orifice and said jewel-mount orifices being formed in said upper mating surface.

4,545,158

INTERIOR WALL STRUCTURE FOR A TRANSPORTABLE BUILDING MODULE

Jihad F. Rizk, Beirut, Lebanon, assignor to Polyfab S.A.R.L., Beirut, Lebanon

Filed Jun. 14, 1983, Ser. No. 504,364
Int. Cl.⁴ E04H *9/00*
U.S. Cl. 52—79.1 **22 Claims**



1. In a transportable building structure including a frame, a floor secured to said frame, a roof secured to said frame, and at least one exterior wall secured to said frame, an interior wall comprising:

(a) at least one lower horizontal support member rigidly secured to said floor;

(b) wall mounting means secured to said frame adjacent to an upper end of same, said wall mounting means including a flexible portion;

(c) at least one upper horizontal support member united with said flexible portion of said wall mounting means;

(d) a plurality of spaced apart vertical studs rigidly secured between said lower and upper support members; and

(d) a plurality of wall panels secured to said vertical studs so that during transport of said structure, said flexible portion of said wall mounting means will flex and dissipate stresses applied to said wall and minimize any damage thereto.

4,545,159

MODULAR BUILDING SYSTEM AND BUILDING MODULES THEREFOR

Jihad F. Rizk, Beirut, Lebanon, assignor to Polyfab S.A.R.L., Beirut, Lebanon

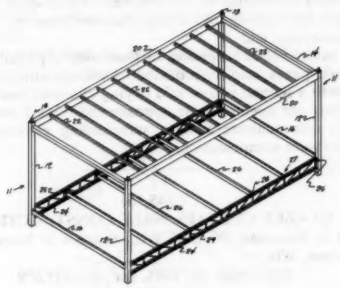
Filed Jun. 14, 1983, Ser. No. 504,326
Int. Cl.⁴ E04H *1/00*
U.S. Cl. 52—79.9 **24 Claims**

1. A transportable building module comprising:

(a) a load bearing support system, said support system comprising a pair of portal frames, said portal frames including two spaced apart vertical columns having upper and lower transverse beam secured therebetween, inwardly from upper and lower ends of same respectively, two upper longitudinally extending beams secured to vertical columns of opposite portal frames adjacent upper ends of same, a plurality of spaced apart roof purlins secured between said upper longitudinal beams below upper surfaces of same and at different locations defining a predetermined slope thereacross, two longitudinal open web trusses secured to said vertical columns of said portal frames, inwardly from lower ends of same, a plurality of spaced apart tubular floor purlins secured between said open web trusses, upper surfaces of said floor purlins, open web trusses and lower horizontal beams of said portal frames generally defining a floor area of said module and being substantially coplanar, and a monolithic, reinforced concrete floor produced in situ over said floor area;

(b) a roof structure secured to said roof purlins, said roof structure comprising a plurality of panels secured to said roof purlins and a waterproof membrane secured over said panels, said roof structure following said predetermined slope defined by said roof purlins;

(c) a plurality of exterior panels secured to said support system along all intended exterior sides of same and to adjacent panels, said panels extending from below said



open web trusses above said upper longitudinal beams and defining a flange thereat extending inwardly of said beams, said panel flanges defining a parapet therealong;

(d) a water vapor barrier material received between said exterior panels and said support system and being secured thereat, said barrier material being spaced apart from at least a portion of an inside surface of said panels along the length of same and defining a ventilating passageway therealong;

(e) a plurality of brackets secured to said support system adjacent an upper end of same, said brackets including an inwardly extending flexible portion;

(f) a ceiling grid located below said roof purlins and being secured at peripheral edges of same to said flexible portions of said brackets;

(g) at least one interior wall structure located within said support system, said wall structure comprising lower support means rigidly secured to said floor, upper support means united with said ceiling grid, vertical wall studs secured between said upper and lower support means and interior wall panels secured to said studs so that during transit of said module, said flexible portion of said brackets will dissipate stresses induced to minimize damage to said at least one interior wall.

4,545,160

WINDOW

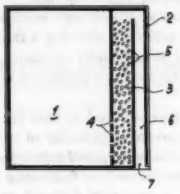
Paul Grether, Seuzach; Kurt Brader, Winterthur, and Bruno Keller, Zurich, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Mar. 23, 1983, Ser. No. 478,026

Claims priority, application Switzerland, Apr. 2, 1982, 2035/82

Int. Cl.[4] E06B 7/12

U.S. Cl. 52—172 17 Claims



1. A window having

at least two panes disposed in spaced relation to define a space therebetween;

a drying chamber extending at least over a partial length of said panes and communicating with said space adjacent one end of said chamber;

a desiccant in said drying chamber which is characterized in being a dust filter and an absorbent for gaseous pollutants;

means for opening said drying chamber to permit removal of desiccant; and

an antechamber extending at least over a partial length of said panes, said antechamber communicating at one end with a second end of said drying chamber and having at least one opening at an opposite end of said antechamber to communicate with a surrounding environment for pressure compensation.

4,545,161

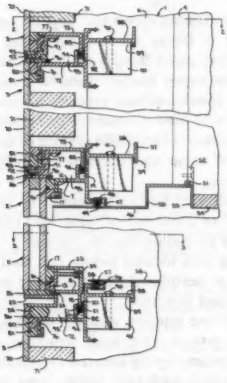
GLAZED CURTAIN WALL CONSTRUCTION

Ubald A. Baumann, Wausau, Wis., assignor to Marmet Corp., Wausau, Wis.

Filed Mar. 21, 1984, Ser. No. 591,679

Int. Cl.[4] E04H 1/00

U.S. Cl. 52—235 11 Claims



1. A curtain wall construction for a building, comprising a plurality of spaced vertical supports, a plurality of generally rectangular exterior units supported by the vertical supports and located outwardly of said vertical supports, each unit being rectangular in shape and including an upper horizontal member, a lower horizontal member; and a pair of vertical jambs connecting the upper horizontal member and lower horizontal member, said units being disposed in stacked and side-by-side relation in said curtain wall, one of said horizontal members having a vertically extending groove and the other of said horizontal members having a vertical flange disposed in said groove to provide a first tongue and groove connection between the lower horizontal member of one unit and the upper horizontal member of an adjacent unit, and abutment means formed on the sides of said vertical supports the upper horizontal member of each unit having a downwardly facing recess engaged with said abutment means to support the upper horizontal member from said vertical supports, a first of jambs having a vertically extending groove and the second of said jambs having a vertically extending flange, the flange on said second jamb being disposed in the groove in the first jamb of the next adjacent unit to provide a second tongue and groove connection between the jambs of said adjacent units.

4,545,162

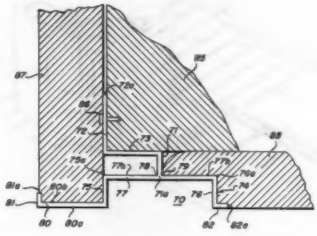
MOLDINGS

Julian J. Attaway, Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed May 5, 1983, Ser. No. 491,902

Int. Cl.[4] E04B 5/00

U.S. Cl. 52—255 36 Claims



1. A molding shaft adapted to be associated with sub-structure of a building and be disposed intermediately of finish material, said molding shaft comprising, reveal wall structure including, a laterally open channel having an interior to be revealed as trim between first and second lateral terminal ends of said reveal wall structure, and said channel comprising, first and second side walls having outside surfaces to be concealed, and a web having a first junction with said first side wall of said channel and a second junction with said second side wall of said channel, said channel side walls laterally being straight walls forming approximately equal angles of either about a right angle and about a 135 degree angle in magnitude with said web, and said reveal wall structure further comprising a first flange outside said channel, said first flange being connected with an outer lateral end of one of said side walls of said channel and having forward and rearward surfaces and said first lateral terminal end of said reveal wall structure, for said finish material to extend behind said rearward surface of said first flange and thus be locally masked by said first flange while having said forward surface of said first flange and said interior of said channel revealed as trim between said first and second lateral terminal ends of said reveal wall structure, and said said molding shaft further including lead wall structure comprising, a stub wall, and a lead wall connected with said stub wall and forming a lead wall angle with said stub wall laterally of said molding shaft about equal to each of said angles formed by said side walls of said channel with said web, said lead wall having a lateral free end and extending laterally of said molding shaft beyond said channel outwardly aside from said one of said side walls of said channel to said lateral free end, said stub wall having a lateral end at junction with the rear of said channel

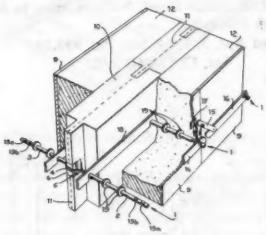
web marginally inwardly from said junctions of said channel web with said first and second side walls of said channel, and said stub wall forming first and second substantially right angular coves with said web and offsetting said web from said lead wall, for said lead wall to be fastened laterally aside from said one of said channel side walls to said sub-structure having said lead wall against said sub-structure and for said finish material when placed substantially at said lateral terminal ends of said reveal wall structure and said first and second side walls of said channel, and substantially at said sub-structure and said coves and behind said first flange to conceal said sub-structure, said lead wall structure and said outside surfaces of said side walls of said channel, so as to have the interior of said channel along with said forward surface of said first flange exposed as trim between said lateral terminal ends of said reveal wall structure.

4,545,163

HEAT INSULATED TIE ROD FOR CONCRETE WALL MEMBERS

Ovila Asselin, 351 rue Principale, Eastman, (Quebec), Canada J0E 1P0

Filed Dec. 28, 1983, Ser. No. 566,291
Claims priority, application Canada, Nov. 15, 1983, 441173
Int. Cl.[4] E04B *2/04*; E04G *17/08*
U.S. Cl. 52—378 **16 Claims**



1. A tie rod for setting and holding together a pair of frame walls in spaced apart relationship with, if desired, a heat insulating panel therebetween, said tie rod being made of two separate coaxial portions each having a loop interlinked with a loop on the other coaxial portion and connected to each other by a central, heat insulating body extending through and spacing said loops, said body having a high resistance to crushing.

4,545,164

WALL SPACER

Charles W. Mualem, 12 Woodstone Dr., New Berlin, N.J. 08009

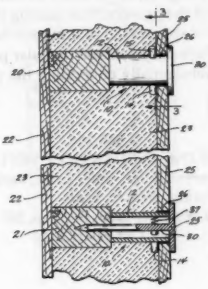
Filed May 2, 1983, Ser. No. 490,386
Int. Cl.[4] E04B *1/74*
U.S. Cl. 52—404 **2 Claims**

1. A spacer device increasing the insulation space within hollow building walls, which walls comprise a first planar surface affixed to one or more supporting members, and a second planar surface spaced from the first planar surface with the support members between them to form a space for containing insulating materials, said spacer device comprising:

a. a hollow cylinder having a first end engaged with one of said supporting members and a second end placed in an aperture formed in said second planar surface;

b. two or more pin means extending chordally through apertures formed in the side wall of said cylinder, said pin means being located intermediate the first and second ends of said cylinder; and,

c. compression spring means attached to each said pin means and to the inner surface of said cylinder for biasing said pin means to a first position outside said cylinder to form a bearing surface for engaging said second planar surface, said pin means being compressible against said spring means to permit movement of said spring means to a second position within said cylinder whereby the spacer device may be inserted through the aperture in the second



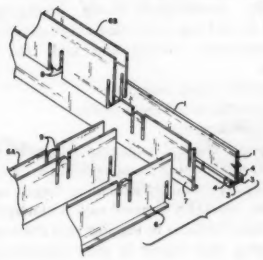
planar surface into engagement with one of said support members and the pin means released to retain the spacer device within said wall space.

4,545,165

MODULAR MONOLITHIC CEILING GRID SYSTEM

Bruce P. Carey, Saugus, and Richard M. O'Toole, Culver City, both of Calif., assignors to Integrated Ceilings Inc., Los Angeles, Calif.

Filed Aug. 15, 1983, Ser. No. 523,018
Int. Cl.[4] E04C *2/42*
U.S. Cl. 52—488 **19 Claims**



1. A suspended sub-ceiling structure comprising

a suspended lattice framework of intersecting support rails, each rail having a vertical web part and a horizontal flange part extending outwardly in both directions at the lower edge of the web, forming an inverted T cross-section,

a plurality of rectangular modular panels removably disposed within openings defined by said support rails, one panel to each opening, each panel being formed from intersecting louvers defining rectangular cell openings, each louver having a U-shaped cross-section, the thickness of the louvers being substantially equal to the width of the support 15 rail flanges,

a plurality of perimeter strips, one along each of the four sides of each of said panels,

means for attaching said perimeter strips to the ends of the louvers,

means integral with said perimeter strips for supporting said panels upon the upper surfaces of the support rail flange parts, with the lower surfaces of the louvers coplanar with the lower surfaces of the support rails and the exposed

vertical surfaces of said perimeter strips aligned vertically with the outer edges of the support rail flange parts,

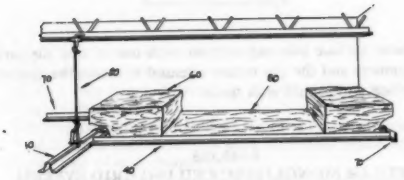
whereby the exposed surfaces of the perimeter strips and the support rail flange parts are made to blend, simulating the appearance of the louvers, thus causing the overall ceiling to present the appearance of a monolithic louvered open cell grid pattern in which said modular panels are visually integrated, substantially concealing the panel outlines.

4,545,166

CEILING INSULATION SYSTEM

William H. Kielmeyer, Englewood, Colo., assignor to Manville Service Corporation, Denver, Colo.

Filed Nov. 21, 1983, Ser. No. 553,465
Int. Cl.[4] E04B *5/52*
U.S. Cl. 52—484 **21 Claims**



1. A ceiling insulation system comprising:

(a) a support channel having (i) a longitudinal uppermost surface; (ii) a pair of generally downwardly extending legs projecting from either side of said uppermost surface; (iii) a pair of laterally extending support flanges projecting from said legs; and (iv) a pair of oppositely positioned, generally downwardly-facing engagement surfaces formed in said legs extending longitudinally intermediate said uppermost surface and said laterally extending flanges:

(b) suspension means including

(i) joist/purlin attachment means;

(ii) a suspension rod;

(iii) support channel engaging means in the form of a C-shaped clamping member with two arms each having a generally inwardly extending finger, said fingers extending inwardly beneath said downwardly facing engagement surfaces to support said channel; a means for clamping said fingers in their channel-engaging position; and

(iv) means for securing said support channel engaging means to said suspension rod; and

(c) a generally rigid insulation board, said board being at least partially supported on one of said laterally extending flanges of said support channel.

4,545,167

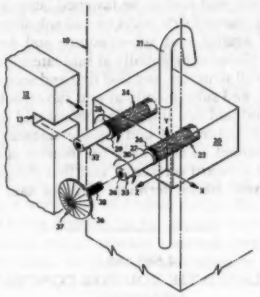
METHOD AND APPARATUS FOR MOUNTING FACING PIECES TO A BUILDING STRUCTURE

Clifford D. Brock, Louisville, Colo., assignor to CCMC, Inc., Louisville, Colo.

Filed Oct. 27, 1983, Ser. No. 545,837
Int. Cl.[4] E04H *13/00*
U.S. Cl. 52—509 **32 Claims**

1. An apparatus for attaching face pieces to a structure said apparatus comprising:

an array of mounting bolts fixedly attached to the structure in predetermined horizontal row (x-axis) and vertical tier (y-axis) alignment positions, said mounting bolts being capable of receiving face plates and having eccentric support sections which, upon being turned, urge inside surfaces of slots in the face pieces so that said face pieces are fixed in alignment positions whose depth (z-axis) is



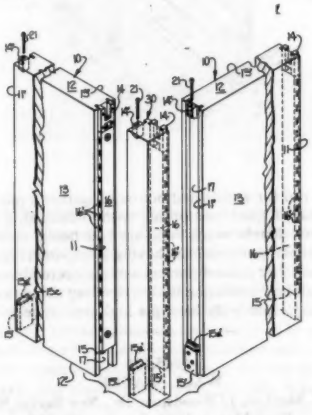
fixed by compressing the face pieces between their respective face plates and the structure.

4,545,168

INTERCONNECTING WALL PANELS

Robert F. Dalton, Jr., High Point, N.C., assignor to Alma Desk Company, High Point, N.C.

Filed Apr. 3, 1984, Ser. No. 596,262
Int. Cl.[4] E04B *2/82*
U.S. Cl. 52—588 **14 Claims**



1. A wall panel for interconnection with other correspondingly constructed wall panels to form walls of predetermined size and arrangement, said wall panel being generally rectangular in overall shape and having opposing vertical sides, opposing horizontal ends, and opposing vertical faces, upper and lower connectors carried by each of said vertical sides, the upper connector on one side of said panel being a female connector and adapted to interconnect with a male connector on the upper side of an adjacent panel when panels are assembled to form a wall, the upper connector on the opposite side of said panel being a male connector and adapted to interconnect with a female connector on the upper side of an adjacent panel when panels are assembled to form a wall, the lower connector on one side of said panel being a female connector and adapted to interconnect with a male connector on the lower side of an adjacent panel when panels are assembled to form a wall, and the lower connector on the opposite side of said panel being a male connector and adapted to interconnect with a female connector on the lower side of an adjacent panel when panels

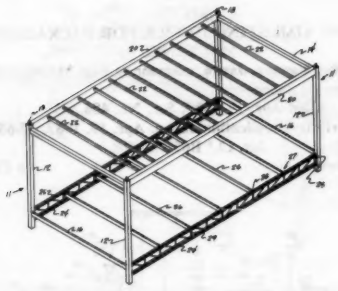
are assembled to form a wall, each said upper and lower connector on each side of said panel being symmetrically disposed along a vertical line passing through the midpoint of the side of the panel so that the opposing vertical faces of adjacent panels when assembled to form a wall are in substantial alignment.

4,545,169

PREFABRICATED TRANSPORTABLE CONCRETE FLOOR SYSTEM AND METHOD FOR PRODUCING SAME

Jihad F. Rizk, Beirut, Lebanon, assignor to Polyfab S.A.R.L., Beirut, Lebanon

Filed Jun. 14, 1983, Ser. No. 504,362
Int. Cl.⁴ E04B *5/04*
U.S. Cl. 52—601 **18 Claims**



1. A transportable monolithic reinforced concrete floor comprising:

(a) a frame for said floor, said frame including two longitudinal spaced apart open web trusses and a plurality of quadrilateral tubular beams secured between said trusses in predetermined spaced apart relation along the length of same, said tubular beams being lesser in height than said trusses; upper surfaces of said trusses and said tubular beams being generally coplanar;

(b) a plurality of shear connectors secured along upper surfaces of said trusses and said tubular beams and extending upwardly therefrom;

(c) a reinforcing mesh material disposed over said trusses and said tubular beams with a free end of said shear connectors passing therethrough, said reinforcing material being generally located above upper surfaces of said trusses and said tubular beams; and

(d) a monolithic concrete slab formed in situ over said frame, said concrete slab having a predetermined thickness and encapsulating said shear connectors and said mesh material, a lower surface of said slab being substantially coterminous with said upper surfaces of said trusses and said tubular beams.

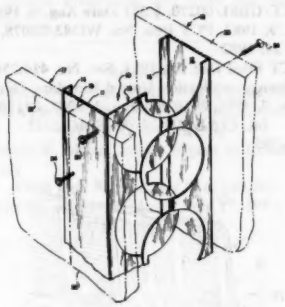
4,545,170

EXPANDED METAL PRODUCTS

Richard Shirey, Avon, Ohio, assignor to Donn Incorporated, Westlake, Ohio

Filed Dec. 21, 1983, Ser. No. 563,995
Int. Cl.⁴ E04C *2/42*
U.S. Cl. 52—670 **34 Claims**

1. An expanded metal formed from a single piece of sheet metal comprising a first portion, a second portion, said portions being substantially coplanar, and an array of legs extending substantially along the plane of said first and second portions, said legs being connected at one end to said first portion by a tight fold and at the other end to said second portion by a tight fold, said legs at their ends providing overlapping portions engaging the adjacent part of said first and second portions to provide two engaging layers adjacent to each fold, said metal of said piece of sheet material being substantially undistorted



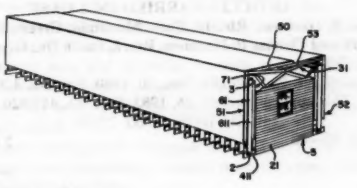
during the expansion thereof except at said folds, whereby said expanded metal is relatively stable when subjected to stresses.

4,545,171

PREFABRICATED FOLDING STRUCTURE

Harry Colvin, Barnegat, N.J., assignor to Shanni International, Inc., Freehold, N.J.

Filed May 5, 1983, Ser. No. 491,815
Int. Cl.⁴ E04B *1/344*
U.S. Cl. 52—79.5 **20 Claims**



1. A prefarbicated folding structure comprising:

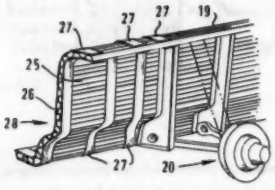
at least one pre-erected central core comprised of at least two oppositely arranged interior walls and a floor extending therebetween, and a plurality of prefabricated structural members including at least one floor section, at least one ceiling section, and at least three exterior wall members, said at least one floor member being pivotedly connected horizontally at one end to said central core floor and pivotedly connected horizontally by a non-articulatable joint at its opposite end to either a folding exterior front wall member, or a folding exterior rear wall member,

said wall members being pivotedly connected vertically to an interior wall member on the same side of the central core as the connection of the at least one floor section, so as to form either a compact folded structure, wherein said structural members are pivotedly positioned inwardly about said central core so as to lie in close proximity to and substantially parallel to said corresponding interior wall member, or a sturdy habitable structure, wherein said structural members are pivotedly positioned outwardly from said central core so as to define at least one room arranged adjacent to said central core.

4,545,172
ENERGY ABSORBING STRUCTURE

Gordon A. Wardill, Cranfield, England, assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/GB81/00270, § 371 Date Aug. 9, 1982, § 102(e) Date Aug. 9, 1982, PCT Pub. No. WO82/02078, PCT Pub. Date Jun. 24, 1982
PCT Filed Dec. 14, 1981, Ser. No. 414,259
Claims priority, application United Kingdom, Dec. 12, 1980, 8040041; Apr. 7, 1981, 8110795; Jun. 3, 1981, 8117069
Int. Cl.[4] B62D *21/00*; E04C *2/32*
U.S. Cl. 52—795 9 Claims

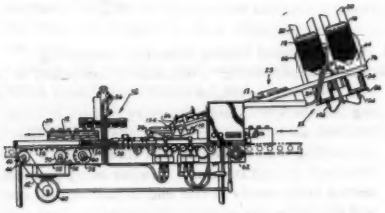


1. An energy absorbing structure comprising a wall having a plurality of parallel ridges extending in a longitudinal direction, and a plurality of spaced transversely extending reinforcement of longitudinal dimension substantially less than the extent of the wall secured to the wall on or adjacent to each ridge at one or more points along the length of the wall, the dimensions of the ridges and the spacing between the said points and the ends of the wall being such that the wall collapses progressively when a load is applied thereto in the longitudinal direction.

4,545,173
APPARATUS FOR SECURING CARTONS ON THE TOP OF ARTICLES CARRIED IN A CASE

Thomas S. Hartness, Rte. 12, Paris Mountain, Greenville, S.C. 29609, and Thomas P. Hartness, Rte. 2, Smith Dr., Greenville, S.C. 29067

Division of Ser. No. 205,194, Nov. 10, 1980, Pat. No. 4,392,586. This application Feb. 16, 1983, Ser. No. 467,020
Int. Cl.[4] B65B *21/00*, *27/04*
U.S. Cl. 53—48 7 Claims



1. An apparatus for placing a plurality of cartons over the tops of articles carried in a case on a moving conveyor comprising:

a presser foot positioned directly over said moving conveyor at a height for permitting said cases with said articles provided therein to pass thereunder;

a power operated cylinder operably connected to said presser foot for selectively lowering said presser foot for forcing said cartons on said articles and for raising said presser foot;

means for activating said power operated cylinder responsive to a case being positioned directly below said presser foot causing said presser foot to be lowered down on said cartons carried on top of said articles in said case;

said presser foot including,

(i) a movable presser plate,

(ii) apertures provided in said movable presser plate adapted to extend over the tops of said articles carried in said case positioned below said presser foot,

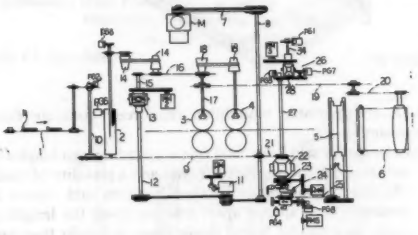
(iii) means for permitting said presser plate to move longitudinally in the direction of travel of said case and conveyor when said presser plate is forcing said cartons down over the top of said articles for securing said cartons to a group of said articles carried in said case, and

(iv) means for returning said presser plate back to its initinal longitudinal position responsive to said power operated cylinder raising said presser foot.

4,545,174
TIMING ADJUSTING DEVICE FOR PACKAGING MACHINES

Kiyoshi Seko, Nagoya, Japan, assignor to Fuji Machinery Co., Ltd., Nagoya, Japan

Filed Apr. 19, 1983, Ser. No. 486,355
Claims priority, application Japan, Apr. 19, 1982, 57-65116
Int. Cl.[4] B65B *41/18*
U.S. Cl. 53—51 6 Claims



1. A timing adjustment device for a packaging machine which includes a feed conveyor for articles to be packaged, a web of patterned wrapping paper for packaging said articles, and a seal cutter for sealing and cutting the packages, comprising:

(a) input means for setting as digital signals values of a cutting pitch of said seal cutter and a thickness of said articles to be wrapped by said web of patterned wrapping paper;

(b) a memory for storing dimensional and numerical data including a dimension from said feed conveyor to said seal cutter, a dimension from a registration mark pointer to said seal cutter, the cutting pitch, the article thickness, and an angle of said seal cutter;

(c) a processor for reading said dimensions and numerical values from said memory, computing an initial angle to derive timing of operation of said seal cutter with respect to said articles fed by said feed conveyor and said patterned wrapping paper, and feeding a control signal based on the result of said computation to a motor drive control unit;

(d) a first control motor coupled through a first differential gear mechanism to a drive system for said seal cutter for adjusting the initial angle of said seal cutter with respect to said feed conveyor under the control of said motor drive control unit;

(e) a second control motor connected through a second differential gear mechanism to a timing mechanism for adjusting timing of operation of said seal cutter with respect to said patterned wrapping paper for adjusting a phase of said timing mechanism with said seal cutter serving as a reference under the control of a signal from said motor drive control unit; and

(f) a pulse generator for detecting an angular displacement of the drive system for said timing mechanism and said seal cutter and delivering a detected signal to said processor.

4,545,175

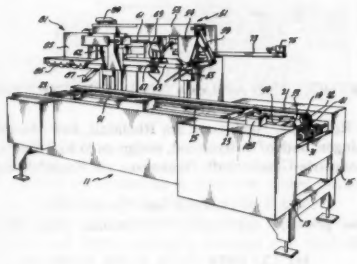
PROGRAMMABLE RANDOM SIZE CASE SEALING MACHINE

Joel M. Beckett, Eatonville, Wash., assignor to Marq Packaging Systems, Inc., Yakima, Wash.

Continuation-in-part of Ser. No. 388,655, Jun. 15, 1982, Pat. No. 4,517,784, and a continuation-in-part of Ser. No. 435,363, Oct. 20, 1982, Pat. No. 4,515,579. This application Dec. 22, 1982, Ser. No. 452,313

Int. Cl.⁴ B65B *7/20, 57/02*

U.S. Cl. 53—69 **25 Claims**



1. A programmable random size case sealing machine comprising:

(A) conveyor means for moving cases to be sealed along a path of travel;

(B) gate means located at the infeed end of said conveyor means for controlling the receipt of cases by said conveyor means;

(C) position adjustable case centering means for centering cases about said path of travel;

(D) position adjustable case sealing means located along said path of travel for selectively sealing the top and bottom of cases moved by said conveyor means;

(E) case position sensing means for sensing both the front and rear position of cases moved by said conveyor means;

(F) case infeed sensing means for sensing the presence of a case on the infeed side of said gate means;

(G) programming means for producing programming information for controlling predetermined operations of said random size case sealing machine; and

(H) a central processing unit coupled to:

(1) said case position sensing means for receiving information about the front and rear position of cases moved by said conveyor means and updating said front and rear position information as said conveyor means moves cases along said path of travel so as to keep track of said front and rear case positions as cases are moved along said path of travel;

(2) said case infeed sensing means for receiving information about the presence of the case at the infeed side of said gate means;

(3) said programming means for receiving and storing said programming information;

(4) said gate means, for actuating said gate means to allow a case to be received by said conveyor means when said conveyor mens is in a predetermined position;

(5) said position adjustable case centering means for controlling said position adjustable case centering means to maintain cases received by said conveyor means centered about said path of travel; and,

(6) said position adjustable case sealing means for controlling said position adjustable case sealing means so that the top and bottom of cases moved by said conveyor means along said path of travel are selectively sealed by said position adjustable case sealing means in accordance with the programming information received by said central processing unit from said programming means.

4,545,176

CARTON SEALING MACHINE WITH POSSIBILITY OF IMMEDIATE OPENING OF THE SEALING AREA DURING WORKING

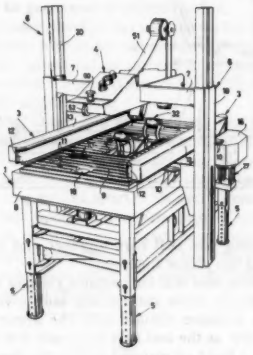
Augusto Marchetti, Milan, Italy, assignor to Comarme, S.p.A., Milan, Italy

Filed Dec. 8, 1982, Ser. No. 449,469

Claims priority, application Italy, Feb. 17, 1982, 19692 A/82

Int. Cl.⁴ B65B *57/00*

U.S. Cl. 53—76 **10 Claims**



1. A carton sealing machine, comprising:

a carton support base;

a pair of motor-driven conveying belts mounted on movable supporting structures positioned on opposite sides of said support base and movable towards each other from a position of maximum mutual separation for engagement of the belts with the carton sides and movable away from each other;

an upper sealing head engageable from above with the carton top and biased by its weight towards a rest position of maximum lowering;

first motor means for moving the supporting structures of said conveying belts towards and away from each other;

second motor means for lifting the sealing head from the rest position; and

control means operatively connected to said first and second motor means when actuated for causing displacement of said belt conveying structures to the position of maximum separation and displacement of the sealing head to a position of maximum lifting with respect to said carton support base.

4,545,177

PACKING PROCESS AND APPARATUS

Timothy T. Day, London, England, assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Continuation of Ser. No. 185,690, Sep. 10, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,407

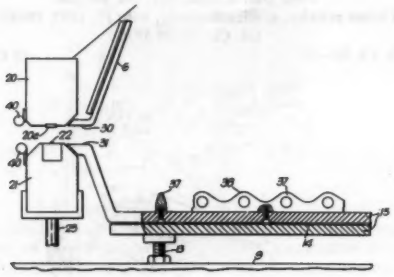
Claims priority, application United Kingdom, Sep. 14, 1979, 7931970

Int. Cl.⁴ B65B *31/02, 53/06*

U.S. Cl. 53—434 **3 Claims**

1. A process for packaging commodities such as meat, bacon, cheese or the like comprising the steps of:

(a) loading a commodity into a bag of heat sealable, thermoplastic film material,
(b) disposing the loaded bag in a vacuum chamber;
(c) draping the neck and mouth of the bag across a lower seal bar and a lower heated lip within said chamber, said lip being located between the seal bar and the commodity;
(d) holding the bag open by applying vacuum to the material of the bag mouth to hold same in its draped position across said seal bar;
(e) closing the vacuum chamber and evacuating same thereby evacuating the gas or air from within the bag and as the chamber is closed, positioning an upper seal bar and lip above their corresponding lower members;



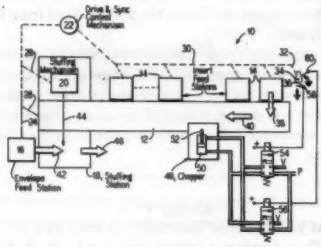
(f) bringing said seal bars together and consequently said heated lips closer together;
(g) pressing said seal bars against the bag mouth to seal the bag mouth while maintaining said lower lip away from direct pressure contact with the upper lip and the bag whereby, as the seal bars close and seal the bags, the lips cause a band of material across the bag to be heated to fusing temperature without applying pressure to said band; and,
(h) subsequently, restoring atmospheric pressure in said chamber thereby causing the material in the heated band to contact the opposing bag wall and fuse thereto.

4,545,178

CHOPPER FOR AN ENVELOPE STUFFING MACHINE

Thiruvenkata R. Parthasarathi, Chicago, Ill., assignor to Compmail Systems, Inc., Addison, Ill.

Filed Dec. 15, 1983, Ser. No. 561,674
Int. Cl.[4] B65B *63/00*
U.S. Cl. 53—435 **20 Claims**



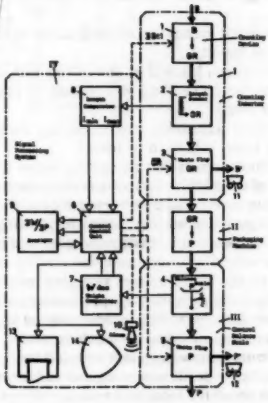
20. In a method of stuffing envelopes with insert stacks of a plurality of unjoined sheets, in which the sheets are moved onto a conveyor path from respective insert bins to form said stacks and stepped along the conveying path to a stuffing station and in which the sheets are stuffed into an envelope which is fed to the stuffing station from an envelope bin, the improvement comprising: providing a stuffing insert of a predetermined number of insert sheets including a predetermined sheet sequence in the form of a booklet of such sheets joined along one edge, comprising the steps of:
sequentially moving said multisheet booklets onto the conveying path;
stepping the booklets along the path;
sequentially receiving the booklets at a cutter and cutting off the joined edges of the sheets to form a stack of unjoined insert sheets;
stepping the multisheet insert stacks to a stuffing station; and
sequentially stuffing envelopes with respective multisheet insert stacks with said sheets being in an unjoined state.

4,545,179

METHOD AND APPARATUS FOR PRODUCING PACKAGES

August Rebsamen, Neuhausen am Rheinfall, and Martin Löw, Löhningen, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Sep. 14, 1983, Ser. No. 532,056
Claims priority, application Switzerland, Sep. 16, 1982, 5491/82
Int. Cl.[4] B65B *57/20, 65/08, 57/00*
U.S. Cl. 53—443 **8 Claims**

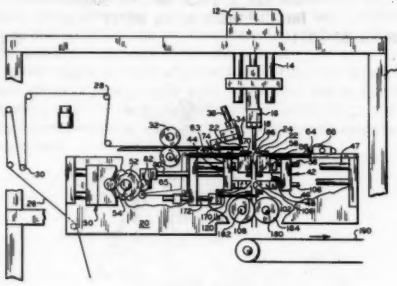


1. A method for producing packages wherein each package contains a whole number of stackable, similar objects which are conveyed in a row for packaging and the weight of each package is to remain within given limits, said method comprising:
counting a number of contiguous objects in the row;
forming groups of objects each having the counted number of objects;
determining the length of each respective group in the direction of the row;
bringing each respective group to a balance scale only if the group has a length within predetermined limits;
measuring the weight of each respective group;
rejecting a group if its weight lies below a given weight value; and
packaging groups whose length is within the predetermined limits.

4,545,180
METHOD AND APPARATUS FOR MAKING AND FILLING PACKETS WITH A PRODUCT

Yun H. Chung, and Dennis E. Chung, both of Rossford, Ohio, assignors to MPR Corporation, Perrysburg, Ohio

Filed Dec. 16, 1982, Ser. No. 450,275
Int. Cl.[4] B65B *57/04;* B31B *33/74*
U.S. Cl. 53—456 10 Claims



1. A method of producing at least one sealed packet filled with a product, comprising the steps of:

(a) providing a generally horizontally disposed individual segment of sheet packaging material at a predetermined position;

(b) urging a central portion of the individual segment vertically downwardly relative to the side portions of the segment to form a channel-shaped member having a bottom wall and vertically extending spaced apart opposed side walls;

(c) maintaining a vertically extending selected portion of the opposed side walls in generally parallel spaced apart relationship;

(d) simultaneously with step (c), sealing the opposed side walls together at horizontally spaced apart locations positioned on opposite sides of said selected portion and extending upwardly from the bottom wall toward the upper end of the side walls for producing at least one cavity open at the upper end;

(e) subsequent to step (d), filling the cavity with a product; and

(f) sealing the upper edge portions of the opposed walls of the channel-shaped member together to close the upper end of the cavity whereby a filled sealed packet is produced.

6. A packaging machine for producing at least one sealed packet filled with a product comprising, in combination:

forming means for urging a central portion of a generally horizontally disposed individual segment of sheet packaging material vertically downwardly relative to the side portions of said segment to form a channel-shaped member having a bottom wall and vertically extending opposed side walls;

side sealing means for sealing said opposed side walls together at horizontally spaced apart locations positioned on opposite sides of a vertically extending selected portion of the opposed side walls, said sealing locations extending vertically upwardly from the bottom toward the upper end of the side walls for producing at least one cavity open at the upper end, said side sealing means including means for maintaining said selected portion of the opposed side walls in generally parallel spaced apart relationship during the side sealing operation;

means for filling the cavity with a product after said side sealing means completes the side sealing operation; and

top sealing means for sealing the upper edge portions of said opposed side walls of said channel-shaped member together to close the upper end of said cavity whereby a filled sealed packet is produced.

4,545,181
APPARATUS AND METHOD FOR OPENING AND TRANSPORTING A FLAT-FOLDED TUBE OF FLEXIBLE MATERIAL

Arnold V. Frankefort, Venray, Netherlands, assignor to Intermate B.V., Deurne, Netherlands

Filed Oct. 3, 1983, Ser. No. 538,428
Claims priority, application Netherlands, Nov. 8, 1982, 8204315
Int. Cl.[4] B65B *9/14*
U.S. Cl. 53—459 13 Claims

1. In apparatus for guiding a flat-folded tube of flexible plastic film from a supply source over a spreader mandrel to open the plastic tube whereby the opened tube may be fitted over an object to be packaged or stored therein,

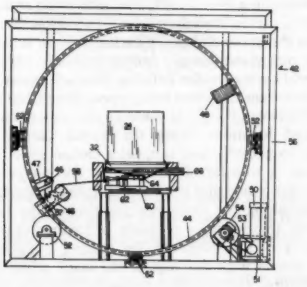
wherein the spreader mandrel includes means for conveying the opened plastic tube to and beyond its downstream end, and means for cutting off an opened tube section at the downstream end of the spreader mandrel independently of the location of said object,

the improvement comprising an extension piece for said spreader mandrel mounted downstream of said cutting means and providing means for guiding the opened cut tube to the object to be packaged or stored therein with said object being spaced apart from said extension piece, and drive means, operating independently of said conveying means and without any contact between said object and said extension piece, for driving the opened cut tube beyond the extension piece and over the object to be packaged or stored therein.

4,545,182
ROTATING FILM WRAPPING APPARATUS WITH TRAVELING CLAMP

Kenneth J. McDowell, Jr., 9108 Elms Ct., Louisville, Ky. 40299

Filed Mar. 24, 1983, Ser. No. 478,311
Int. Cl.[4] B65B *13/04*
U.S. Cl. 53—556 21 Claims



16. Apparatus for wrapping a load comprising load holding means adapted to receive a load and carry said load in a downstream direction, ring means positioned about said load holding means and adapted to rotate about said load holding means, film carriage means mounted to said ring means and adapted to hold a roll of film material and wrap said film material from said roll about said load and said load holding means when said ring means is rotated, film stretching means mounted to said ring adapted to engage said film material and substantially stretch said film material dispensed from said film carriage means, traveling clamp assembly means adapted for movement on a line parallel to said downstream direction into and out of said wrapping area and comprising a first jaw fixed on said line

and a second jaw movable to meet said first jaw and thereby to releasably clamp and hold said film material between said film carriage means and said load, and cutter means movable parallel to said jaw means to sever said film material between said film carriage means said load and to wipe said severed material against said wrapped material.

4,545,183

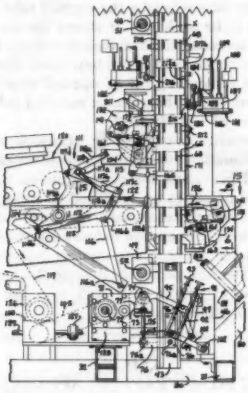
PACKAGING MACHINE

Roger H. Stohlquist, Rockford, Ill., and Roger A. Stenberg, Beloit, Wis., assignors to APV Anderson Bros. Inc., Rockford, Ill.

Continuation-in-part of Ser. No. 604,984, Apr. 27, 1984, abandoned. This application Oct. 19, 1984, Ser. No. 662,706

Int. Cl.[4] B65B *43/24*

U.S. Cl. 53—566 **36 Claims**



1. A packaging machine for feeding, erecting, loading and closing cartons of the type having a pair of side panels connected along fold lines to a pair of end panels and side and end flaps on opposite ends of the respective side and end panels, the packaging machine comprising: an upright carton transfer means extending from a carton infeed station adjacent its lower end past a carton loading station to a carton discharge station adjacent the upper end of the carton transfer means, the carton transfer means including a pair of generally vertically extending lateral carton guides defining parallel carton guide planes, the carton transfer means being open along front and rear sides thereof between the guide planes, a plurality of carton supports at spaced locations along the lateral carton guides each adapted to underlie and support a carton after it is advanced therepast, a transfer slide mounted for reciprocation along each carton guide and having a plurality of pushers at spaced locations along the slides operative when the slide is moved upwardly to advance a plurality of cartons upwardly in step fashion, a carton magazine for storing a stack of flattened carton blanks with one and of the stack adjacent the carton infeed station, carton infeed means for withdrawing a flattened carton blank from said one end of the stack and for erecting and feeding the erected carton to the carton guides with the end panels of the carton disposed alongside the carton guides and side panels extending horizontally between the guides and with the side and end flaps extending through the open front and rear sides of the carton transfer means, drive means for reciprocating the transfer slides, means for operating the carton infeed means in timed relation with the reciprocation of the transfer slides, carton loading means for feeding product along a generally horizontal path into a carton at the loading station, means intermediate the upper and lower ends of the carton transfer means for infolding the side and end flaps on the cartons, carton receiving means adjacent the upper ends of the carton transfer means, and means adjacent the upper end of the carton transfer means for discharging cartons from the carton transfer means onto the receiving means.

4,545,184

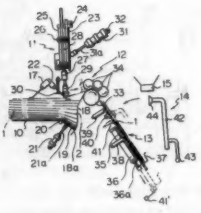
APPARATUS FOR SUPPLYING BAGS OF PLIABLE OR EASILY FLEXIBLE NATURE

Shigeo Akiyama, No. 2519, Oaza Fujioka, Fujioka-cho, Shimotsuga-gun, Tochigi-ken, Japan

Filed Jun. 3, 1983, Ser. No. 500,817

Int. Cl.[4] B65B *43/36;* B65H *9/06*

U.S. Cl. 53—571 **5 Claims**



4. Apparatus for receiving a flexible plastic bag subsequent to removing the bag from a stack of bags and prior to filling the bag in a vertical direction, the apparatus comprising:

an inclined plate having an upper surface and lower surface and being positioned obliquely with respect to the vertical direction;

means for advancing the bag onto the upper surface of the plate;

means for displacing the the center of the bag with respect to the plate along the longitudinal extent of the bag so as to bow the bag,

means for providing a cushion of air between the bag and the upper surface of the plate as the bag slides down the plate;

means for stopping the descent of the bag on the plate;

means for displacing the stopping means in the direction of movement of the bag down the plate;

sensing means for determining when a bag is moving down the plate, the sensing means initiating displacement of the stopping means, and

first vacuum means on the plate for holding one side of the bag against the plate after the bag is positioned thereon.

4,545,185

BINDING APPARATUS FOR PACKING

Hajime Chikatani, Hachioji, Japan, assignor to Kabushiki Kaisha Daisei Kikai, Tokyo, Japan

Filed Feb. 16, 1983, Ser. No. 467,173

Claims priority, application Japan, Feb. 19, 1982, 57-25656

Int. Cl.[4] B65B *51/08*

U.S. Cl. 53—583 **5 Claims**

1. Apparatus for binding closed the openings of bags, said apparatus comprising:

(a) a rotor rotatable about a central axis, said rotor having a circumferential edge in which are located a plurality of grooves which, during use of the apparatus, receive the puckered openings of bags;

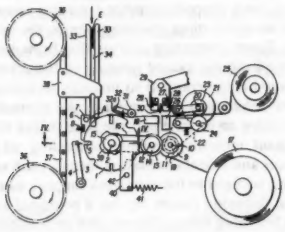
(b) first means for feeding adhesive tape so that it is supported on the circumferential edge of said rotor with its adhesive surface facing outwardly and so that it overlays at least one of said grooves, said first means being operatively connected to said rotor such that a predetermined amount of adhesive tape is used to bind shut the opening of each bag;

(c) second means located adjacent to said rotor for applying a predetermined length of a non-adhesive face-applying tape to the adhesive surface of the adhesive tape at prede-

termined intervals, thereby rendering the adhesive tape non-adhesive at predetermined intervals, a portion of the predetermined length of non-adhesive face-applying tape being located on each side of said at least one of said grooves when the adhesive tape overlays said at least one of said grooves;

(d) third means located adjacent to said rotor for puckering the openings of bags to be bound shut and for feeding them to said rotor such that the puckered opening of a bag is received in each groove in the circumferential edge of said rotor when the groove is overlayed with adhesive tape and such that the puckered opening of the bag forces the adhesive tape down into the groove;

(e) fourth means located adjacent to said rotor for wrapping the adhesive tape around each successive bag so that the leading edge of the adhesive tape lies adjacent to one of said predetermined lengths of non-adhesive face-applying tape; and



(f) fifth means located adjacent said rotor for severing the adhesive tape and the non-adhesive face-applying tape which has been applied to it so as to divide the predetermined length of the non-adhesive face-applying tape into two at least approximately equally sized portions, the leading portion facing the corresponding portion of the non-adhesive face-applying tape on the leading edge of the adhesive tape and the trailing portion of the non-adhesive face-applying tape thereafter constituting the portion of the predetermined length of the non-adhesive face-applying tape on the next successive leading edge of the adhesive tape, which next successive leading edge of the adhesive tape has been created by the severance of the adhesive tape,

whereby both ends of the adhesive tape binding each successive bag have separate, at least approximately equally sized portions of the non-adhesive face-applying tape applied thereto.

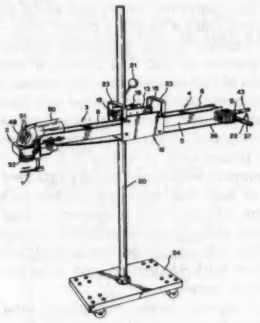
4,545,186

METHOD AND APPARATUS FOR HARVESTING MUSHROOMS AND THE LIKE

Cathal MacCanna, Dublin, Ireland, assignor to Garran Enterprises Limited, Dublin, Ireland

Filed Jul. 21, 1983, Ser. No. 515,764
Claims priority, application Ireland, Jul. 22, 1982, 1759/82
Int. Cl.[4] A01D *45/00*
U.S. Cl. 56—327 R **8 Claims**

1. Apparatus for selective harvesting of mushrooms from a mushroom bed, comprising support means, an elongate frame mounted to said support means and movable vertically and horizontally with respect to said support means and supporting an endless conveyor belt movable along the frame, a knife mounted to the frame, adjustable vertically and movable laterally and longitudinally with respect to the mushroom bed, lifting means disposed above the knife, the lifting means comprising a housing defining an annular chamber, an inlet to the chamber disposed above the cutting blade of the knife and adapted to receive mushrooms cut by the knife, and an outlet from the chamber communicating with said conveyor belt, and means for supplying a flow of air at high velocity into the chamber through an annular orifice in the wall of the chamber, the orifice being so profiled as to direct the supplied air to flow towards the outlet of the chamber whereby a zone of low pressure is created adjacent to the chamber inlet to induce a



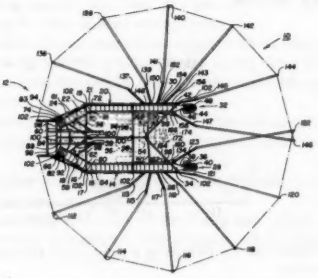
flow of ambient air into the inlet which together with the supplied air forms a stream of air flowing through the chamber whereby the cut mushrooms are lifted into the chamber inlet and are conveyed by the air stream through the chamber to the chamber outlet and onto the conveyor.

4,545,187

APPARATUS FOR HARVESTING FRUIT OR NUTS

Scott Landgraf, Rte. 1, Box 148, Madill, Okla. 73446

Filed Apr. 16, 1984, Ser. No. 600,427
Int. Cl.[4] A01D *46/24, 46/22*
U.S. Cl. 56—329 **20 Claims**



1. An "add-on unit" apparatus to be removably mounted on a farm tractor or other power unit for harvesting fruit or nuts from a tree, said "add-on unit" apparatus comprising:

a forward frame portion;

first mounting means on said forward frame portion, said first mounting means being capable of being removably attached to a first predetermined location on said farm tractor or other power unit;

second mounting means on said forward frame portion, said second mounting means being capable of being removably attached to a second predetermined location on said farm tractor or other power unit;

a first conveyor means having a front portion and a rear portion, said front portion being operatively connected by pivotal means to said forward frame portion for pivotal movement with respect thereto, said first conveyor means extending rearwardly from said forward frame portion and along one side of said farm tractor or other power unit;

a second conveyor means having a front portion and a rear portion, said front portion being operatively connected by pivotal means to said forward frame portion for pivotal movement with respect thereto, said second conveyor means extending rearwardly from said forward frame portion in a generally parallel relationship with respect to said first conveyor means and along an opposite side of said farm tractor or other power unit;

a cross member means operatively connected between said rear portion of said first conveyor means and said rear portion of said second conveyor means, said cross member means being positioned behind said farm tractor or other power unit and including means capable of removably mounting said cross member means to said farm tractor or other power unit;

a first support means operatively attached to said rear portion of said first conveyor means to support said rear portion of said first conveyor means a predetermined distance above ground, said first support means includes an offset axle and wheel means to allow said wheel means to pivot with respect to said rear portion of said first conveyor means; and

a second support means operatively attached to said rear portion of said second conveyor means to support said rear portion of said second conveyor means a predetermined distance above ground, said second support means includes an offset axle and wheel means to allow said wheel means to pivot with respect to said rear portion of said second conveyor means.

4,545,188

CROP ENGAGING DEVICE AND METHOD

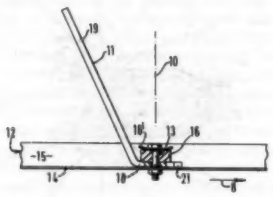
Wilfred E. Klinner, Milton Keynes, England, assignor to National Research Development Corporation, London, England

Filed Mar. 23, 1983, Ser. No. 477,872

Claims priority, application United Kingdom, Mar. 26, 1982, 8209019

Int. Cl.⁴ A01D *43/02, 65/02, 89/00*

U.S. Cl. 56—364 **6 Claims**



1. Apparatus for threshing a grain crop comprising:

a frame,

a rotor mounted on the frame for conveying crop by rotation of the rotor and for threshing the crop while it is being conveyed by the rotor, and

drive means for driving the rotor in rotation,

said rotor comprising support means and a plurality of crop engaging elements mounted on said support means, each crop engaging element having an elongate crop engaging portion extending outwardly from the rotor, and a base portion secured to the support means,

said crop engaging elements being arranged on the rotor in a series of transverse arrays each of which extends in a direction transverse to the principal direction of crop flow through the apparatus, the axis of rotation of the rotor being transverse to said principal direction of crop flow and each transverse array being spaced circumferentially from its adjacent transverse array around the axis of rotation of the rotor,

each crop engaging element comprising a discrete arm which is inclined to a radial plane perpendicular to the rotor axis, said arm being inclined away from said radial plane in the same sense over the whole of its length, the elements of each array being arranged with a number of successive elements along the array being similarly inclined in that said elements are all inclined away from said radial plane in the same sense,

each crop engaging element being unsharpened and being arranged to engage the crop substantially without cutting of the crop, the crop engaging portions of the elements being of sufficient length to protrude into the crop and to effect substantial conveying of the crop,

each element having mounting means for mounting said element on said support means with a preselected inclination which is maintained in normal operation, each element being resiliently yieldable upon contact with an abnormal load and being mounted with sufficient stiffness for the elements to be capable of returning after yielding to their undeflected dispositions at least predominantly by virtue of the resilience of the yielding arrangement without sole reliance on centrifugal effect,

said support means comprising a plurality of support members, each support member having an inner, base portion and an upstanding, shielding flange, the upstanding shielding flange extending outwardly from said base portion away from the axis of rotation of the rotor, said shielding flange being arranged to precede said crop engaging element relative to the motion of the element on rotation of the rotor so as to shield the base of the element,

each said mounting means comprising an axial fastening means and a resilient biasing means, each said discrete arm being secured to its associated support member by a single axial fastening means having a principal axis along which the fastening means extends in a generally radial direction through said base portion of said element and through said base portion of said support means, said resilient biasing means acting to bias said crop engaging element towards said normal operating position,

each said crop engaging element comprising a single elongate member shaped to produce said inclined, discrete outwardly directed arm and said base portion for securement to said support means, each said element being located by a leading surface of the crop engaging element abutting against the trailing surface of the said upstanding shielding flange so as to prevent rotation of the element about the axis of the axial fastening means in normal operation, but such as to allow the crop engaging element to be yielding upon meeting an abnormal load by movement of the arm of the element rearwardly away from the upstanding flange of the support member against the effect of the biasing means.

4,545,189

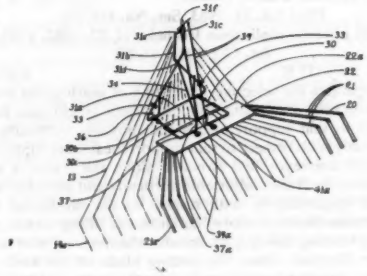
RAKE WITH GRASPING APPARATUS

Larry N. Nelson, R.R. #2, Tekamah, Nebr. 68061

Filed Jan. 23, 1985, Ser. No. 694,147

Int. Cl.⁴ A01D *7/10*

U.S. Cl. 56—400.12 **20 Claims**



1. A rake with grasping apparatus, comprising:

a rake having a handle and a head with tines;

a link pivotally connected at one end to the rake above the free ends of the tines and pivotally connected at the other end to a grasping head at the edge thereof distal its free end, the free end of said grasping head being oppositely disposed to the free ends of the rake tines, whereby said grasping head and said rake head form the jaws of an operable clamp;

means for limiting the pivotal movement of said link between a position generally perpendicular to the rake and an upward position adjacent to the rake;

means for limiting the pivotal movement of said grasping head between a position generally aligned with said link and a closed position with said rake head; and

means attached to the rake handle for controlling the pivotal positions of said grasping head and said link.

4,545,190

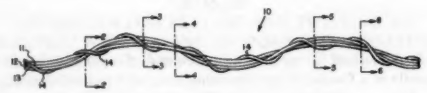
METALLIC CABLE AND METHOD AND APPARATUS FOR MAKING SAME

Grover W. Rye, Cuyahoga Falls, and Kenneth J. Palmer, Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 26, 1983, Ser. No. 535,473

Int. Cl.⁴ D02G *3/48, 3/12;* **D07B** *1/00, 3/12*

U.S. Cl. 57—212 **16 Claims**



1. A metallic cable for reinforcing an elastomeric article comprising: (a) a strand of identical helical shaped untwisted filaments positioned beside and against each other such that each filament of said strand is in line contact with at least one other filament of said strand, the helixes of the filaments of said strand being sloped in a first direction; and, (b) a single filament twisted with said strand in a direction opposite to said first direction.

11. A method of manufacturing a metallic cable comprising the steps of:

(a) drawing a plurality of metallic filaments from a bobbin means, false twisting and forming said plurality of filaments into identical helixes having a given hand and pitch, said helixes being coaxial and each said filament being in line contact with at least one other of said filaments;

(b) drawing a single metallic filament from a bobbin means located on a non-rotating cradle of a cable making apparatus, said cradle being suspended between first and second coaxial rotating flyers with hollow bearings, and guiding said single filament through the hollow bearing of one of said flyers along a path parallel with the axis of rotation of said flyers;

(c) guiding said plurality of metallic filaments and said single metallic filament around a rotating sunken pulley located in the hollow bearing of said first rotating flyer to twist said single filament with said plurality of filaments and form a cable, then guiding said cable towards the radially outer periphery of said first rotating flyer where said cable is redirected towards the radially outer periphery of said second rotating flyer where said cable is directed towards a rotating sunken pulley located in the hollow bearing of said second flyer;

(d) guiding said cable partially around the rotating sunken pulley located in the hollow bearing of said second flyer to further twist said single filament with said plurality of filaments; and

(e) wrapping said cable onto a means for collecting a finished cable.

4,545,191

SPLICER DEVICE TO SPLICE TEXTILE YARNS MECHANICALLY

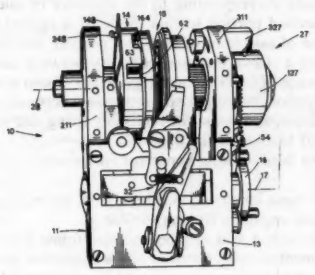
Luciano Bertoli, Salo'; Roberto Badiali, and Claudio Speranzin, both of Pordenone, all of Italy, assignors to Officine Savio SpA, Pordenone, Italy

Filed Feb. 24, 1984, Ser. No. 583,393

Claims priority, application Italy, Mar. 28, 1983, 83357 A/83

Int. Cl.⁴ D01H *15/00*

U.S. Cl. 57—22 **19 Claims**



1. A splicer for mechanically splicing textile yarns, wherein splicing is obtained by coupling two single untwisted yarns and reapplying the twists thereafter, a part of said single yarns being untwisted until twists of a sign opposite to the original twists have been imparted, such part then being doubled and remaining tails being obtained, the doubled tract being then retwisted by imparting a required value of twist, said splicer comprising:

plate means having untwisting and retwisting ring means cooperating at least momentarily with retwisting means,

yarn-coupling means consisting of a pair of means that approach each other at least momentarily,

means to pluck and/or tear excessive tail ends of said yarns, said plucking and/or tearing means acting directly in a direction along the axis of the excessive tail ends at least momentarily,

means to clamp twists in the tracts of yarn not to be torn,

inner clamping means acting at least momentarily on two yarns,

twist-balancing means that act at least momentarily on excessive tail ends, and

means to cause the approach of remaining tails, which bring the remaining tails close to the adjacent whole yarns.

4,545,192

YARN FALSE TWISTING APPARATUS

Detlev Oberstrass, Tönisheide, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 272,940, Jun. 12, 1981, Pat. No. 4,372,106, Ser. No. 273,076, Jun. 12, 1981, Pat. No. 4,389,841, and Ser. No. 429,796, Sep. 30, 1982, Pat. No. 4,486,762. This application Jan. 21, 1983, Ser. No. 459,994

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022421; Jul. 9, 1980, 3025921; Dec. 23, 1980, 3048615; Jun. 5, 1982, 3221352; Jul. 24, 1982, 3227711; Sep. 10, 1982, 3233624

Int. Cl.⁴ D02G *1/08;* **D01H** *1/241;* **F16H** *7/20, 55/36*

U.S. Cl. 57—105 **11 Claims**

1. A drive component adapted for engaging two separate drive belts in a yarn false twisting apparatus or the like, and which is characterized by the ability to withstand the lateral thrust exerted by the drive belts, and comprising

a unitary tubular drive member comprising a first portion having a cylindrical outer surface and a cylindrical bore,

and a second coaxial portion having a cylindrical outer surface and a cylindrical bore, with the diameter of the outer surface of said first portion being greater than the diameter of the outer surface of said second portion, and with the diameter of said bore of said first portion being greater than the diameter of said bore of said second portion,

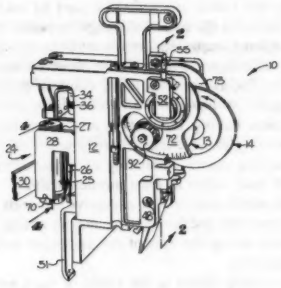
mounting means including a shaft extending coaxially at least substantially through said drive member and affixed thereto for rotatably mounting said drive member to a support bracket or the like, with the diameter of said shaft generally corresponding to the diameter of said bore of said second portion so that the shaft is spaced from the surface of said bore of said first portion, and further including a sleeve disposed coaxially between and spaced from each of said shaft and the surface of said bore of said first portion, bearing means interposed between said shaft and sleeve, and means for releasably fixing said sleeve to a support bracket or the like.

5. A yarn false twisting apparatus comprising

a frame,

a pair of twist imparting members, each having a generally flat yarn engaging friction surface,

means mounting said members to said frame for rotational movement wherein portions of the respective yarn engaging friction surfaces are disposed in opposing relationship and define a twisting zone therebetween,



drive means for operatively rotating each of said members, and such that a yarn may be advanced along a path of travel through said twisting zone while having twist imparted thereto, said drive means including

(a) a support bracket,

(b) a drive whorl rotatably mounted to said support bracket to define a rotational axis, with said drive whorl having a cylindrical external surface adapted for being tangentially contacted by a drive belt,

(c) means mounting said support bracket to said frame for pivotal movement about a second axis which perpendicularly intersects the rotational axis of said drive whorl and so as to permit the rotational axis of the drive whorl to be adjustably aligned so that its rotational axis is perpendicular to the running direction of the tangential drive belt,

(d) a drive pulley rotatably mounted to said support bracket and operatively connected to said drive whorl for concurrent rotation therewith,

(e) a belt pulley operatively connected to each of said twist imparting members,

(f) an idler pulley rotatably mounted to said frame, and

(g) endless belt means operatively interconnecting said drive pulley, said two belt pulleys, and said idler pulley for effecting concurrent rotation thereof with rotation of said drive whorl,

whereby the rotational axis of the drive whorl may be adjustably aligned with respect to the running direction of the tangential drive belt without altering the yarn path through the twisting zone of the twist imparting members.

4,545,193

METHOD FOR PIECING FASCIATED YARN

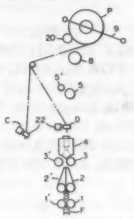
Akira Tanaka; Kazuo Seiki, both of Kariya, and Haruyoshi Nakamura, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 13, 1984, Ser. No. 599,761

Claims priority, application Japan, Apr. 15, 1983, 58-65604; May 11, 1983, 58-80785

Int. Cl.⁴ D01H *15/00, 5/28*

U.S. Cl. 57—261 **6 Claims**



1. A method for piecing a broken end of a yarn with a fiber bundle in a fasciated yarn spinning unit, said unit comprising a drafting means including a back roller pair and a front roller pair for attenuating the fiber bundle and an air nozzle for twisting the fiber bundle by a vortex to form a fasciated yarn, comprising steps of:

a. guiding a yarn to be pieced to an outlet of said air nozzle while nipping it by a displaceable piecing roller means;

b. reversely introducing the yarn into said drafting means through said air nozzle and the front roller pair while controlling the introduced yarn length by reverse directional rotation of said piecing roller means;

c. withdrawing the yarn from the outlet of said air nozzle by normal directional rotation of said piecing roller means while overlapping the fiber bundle on the yarn at the nip point of the front roller pair, the withdrawing speed being controlled to synchronize with the delivery speed of said front roller pair; and

d. generating the vortex in said air nozzle to twist the overlapped portion.

4,545,194

SPINNING METHOD AND APPARATUS FOR PUTTING METHOD TO USE

Yves Juillard, 53, Bd Alfred Wallach, 68100, Mulhouse, France

Filed Apr. 27, 1984, Ser. No. 604,834

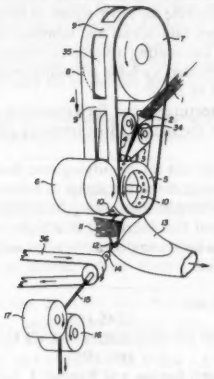
Claims priority, application France, Apr. 29, 1983, 83 07292

Int. Cl.⁴ D01H *7/892, 7/898*

U.S. Cl. 57—400 **9 Claims**

1. Spinning method using fiber bundles selected from a strand of fibers, characterized by the fact that fiber bundles are extracted by means of a removal device, and by the fact that these fiber bundles are caused to move in an axial direction while one of their ends is held in place, the other end remaining free, and by the fact that these fiber bundles are caused to undergo a change of direction in relation to their direction of displacement to impel the free ends of these fiber bundles in a direction essentially perpendicular to the direction of their axial displacement, and to position them horizontally in the

area of thread formation, the thread being caused to rotate and to move in translation, and by the fact the the ends of the fiber



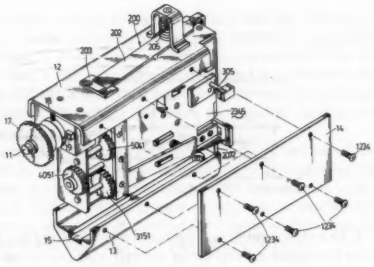
bundles initially held in place are successively freed so that they become integrated with the thread in formation.

4,545,195

APPARATUS FOR PEELING AND TWISTING AN ELECTRIC WIRE HAVING AN INSULATING COATING

Yung H. Liu, No. 12, Alley 76, La. 255, Sec. 1, Kang Ning Rd., Taipei, Taiwan

Filed Jul. 11, 1983, Ser. No. 512,676
Int. Cl.[4] B21F *15/04;* **B65H** *69/06*
U.S. Cl. 57—22 **16 Claims**



1. An apparatus for peeling and twisting an electric wire having an insulating coating comprising:

a machine frame;

a shaft, rotatably mounted on said frame, having thereon a wire clamping cam, an insulating coating cutting cam, a conductor twisting cam and a cut insulating coating disengaging cam, said shaft being adapted to be driven by a motor;

means, mounted on said frame and following said clamping cam, for clamping said wire; and

a machine body, moveably mounted on said shaft, including

an insulating coating cutting means, following said insulating coating cutting cam, for cutting said insulating coating of said wire,

a conductor twisting means, following said conductor twisting cam, for twisting the conductors of said wire, and

a cut insulating coating disengaging means, following said disengaging cam, for disengaging the insulating coating which has been cut,

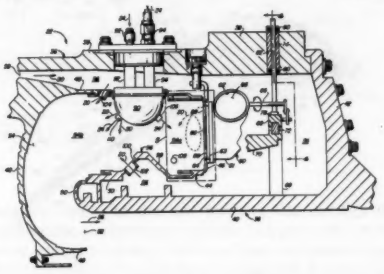
wherein the cams of said shaft and their respective following means are so arranged that they will perform the actions of clamping said wire, cutting said insulating coating, twisting said conductors and disengaging said cut insulating coating when said shaft has revolved a cycle.

4,545,196

VARIABLE GEOMETRY COMBUSTOR APPARATUS

Hukam C. Mongia; Edwin B. Coleman, both of Tempe, and Thomas W. Bruce, Phoenix, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jul. 22, 1982, Ser. No. 400,579
Int. Cl.[4] F02C *3/14*
U.S. Cl. 60—39.23 **5 Claims**



1. High performance variable geometry combustor apparatus, said apparatus having an axis and comprising:

(a) wall means defining a combustion flow passage extending downstream from an upstream end wall portion of said wall means along and within a sidewall portion thereof, said sidewall portion having an inwardly projecting section positioned downstream from said end wall portion;

(b) nozzle means, projecting inwardly through said sidewall portion generally opposite from said inwardly projecting section thereof, for injecting fuel into said flow passage, said nozzle means being spaced apart from said inwardly projecting sidewall section and cooperating therewith to define in said flow passage;

(1) a pilot combustion zone adjacent said upstream end wall portion,

(2) a main combustion zone positioned downstream from and communicating with said pilot zone, and

(3) a barrier for sheltering combustion in said pilot combustion zone against back pressure in said flow passage or adverse interaction with combustion in said main combustion zone; and

(c) means for flowing a selectively variable quantity of pressurized combustion air from a source thereof into said pilot combustion zone, said means (c) including a plurality of mutually spaced inlet openings extending through said end wall, a plurality of valve means each secured to said end wall over one of said openings therein, and means for simultaneously operating said valve means,

said means for simultaneously operating said valve means comprising an actuating member rotatable relative to said wall means about said axis, and linking means interconnected between said actuating member and said valve means for simultaneously operating said valve means in response to rotation of said actuating member,

said actuating member being a unison ring carried by said wall means for rotation about said axis, said valve means each having an actuating rod rotatable about an axis generally parallel to said apparatus axis, and said linking means being interconnected between said unison ring and said valve actuation rods to cause simultaneous rotation of said valve actuation rods in response to rotation of said unison ring.

4,545,197

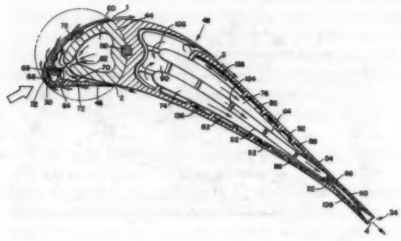
PROCESS FOR DIRECTING A COMBUSTION GAS STREAM ONTO ROTATABLE BLADES OF A GAS TURBINE

Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, which is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, and a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, which is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953. This application Apr. 19, 1983, Ser. No. 486,334

Int. Cl.⁴ F02C *7/00, 7/16*

U.S. Cl. 60—39.05 **19 Claims**



1. A process for directing a combustion gas stream onto the surface of rotatable blades to produce work comprising; passing said combustion gas through a gas nozzle positioned upstream of said rotatable blades, said gas nozzle comprising a plurality of spaced air-foil shaped vanes, passing a fluid having a sonic velocity greater than said combustion gas against and over the exterior surfaces of said vanes at substantially the sonic velocity of said fluid to accelerate the combustion gas beyond the sonic velocity thereof without excessive profile loss.

4,545,198

GAS TURBINE ENGINE CONTROL SYSTEM

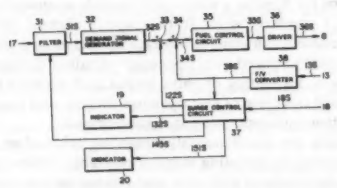
Kenichi Yoshida, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 8, 1983, Ser. No. 521,269

Claims priority, application Japan, Aug. 10, 1982, 57-137916; Aug. 10, 1982, 57-137917; Aug. 10, 1982, 57-120561[U]; Aug. 10, 1982, 57-120562[U]; Dec. 14, 1982, 57-217730; Dec. 28, 1982, 57-227645

Int. Cl.⁴ F02C *9/28*

U.S. Cl. 60—39.25 **26 Claims**



1. An apparatus for controlling a gas turbine engine having a gas turbine gas generator including a compressor and a compressor turbine, a separate power turbine driven by said gas generator, and means for adjusting at least one controlled variable which determines a condition of said gas turbine engine, which condition is related to engine surge, comprising:

(a) a surge sensor sensing the intensity of engine surge;

(b) an actual signal generator for generating an electrical actual signal indicative of an actual value of said gas turbine engine condition;

(c) a demand signal generator for generating an electrical demand signal indicative of a demand value of said gas turbine engine condition;

(d) means for comparing said actual signal with said demand signal to generate an error signal indicative of the difference between said actual and demand values;

(e) means for calculating a value corresponding to a setting of said controlled variable adjusting means to reduce said error signal to zero;

(f) a surge detecting circuit for generating a surge detection signal when the sensed surge intensity exceeds a reference level; and

(g) a control circuit for modifying said demand value based upon said surge detection signal to avoid the engine surge, said control circuit subtracting from said demand value, a control signal that increases at a high rate to a predetermined value and then decreases to its initial value at a low rate.

4,545,199

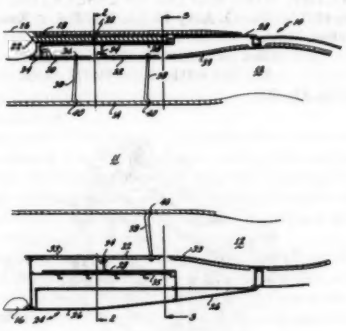
FAN CASCADE REVERSER HAVING DUAL BLOCKER DOORS

Edward M. Sankey, Santee, and Randall J. Seaver, Chula Vista, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Continuation-in-part of Ser. No. 387,770, Jun. 14, 1982, abandoned. This application Jun. 4, 1984, Ser. No. 617,174

Int. Cl.⁴ F02K *3/06*

U.S. Cl. 60—226.2 **9 Claims**



1. In a thrust reversing system for controlling fan gases from a fan jet engine carried by an aircraft, said engine having upper and lower longitudinal sections comprising:

a forward positioned fixed fairing having inner and outer walls;

an inner duct wall carried exterior to said engine and an outer duct wall, spaced therefrom for forming a fan duct with said forward positioned fairing;

a rearwardly translatable fairing positioned adjacent said engine upper longitudinal section that abuts said forward fixed fairing along its upper longitudinal section, forming a streamlined continuation thereof when in a stowed position and exposing an upwardly directed opening therebetween when in a deployed position;

a fixed sleeve surrounding the lower longitudinal section of said engine in an abutting relationship with said fixed fairing;

a translatable sleeve adjacent to the lower and upper longitudinal sections of the engine forming continuation of the fixed fairing inner wall portion whereby, in a stowed position, the translatable sleeve abuts said fixed fairing and when deployed, exposes said opening to said fan duct;

first and second sets of blocker doors circumferentially carried by said translatable sleeve, said first set of blocker doors positioned forward of said second set of blocker

doors and surrounding the upper longitudinal section of said fan duct and said set of second blocker doors substantially surrounding the entire engine whereby, in a stowed position, said sets of doors form a portion of the outer wall of said fan duct, in a partially deployed position of the thrust reverser system direct a portion of said fan gases through said opening and in a fully deployed position direct substantially all of the fan gases through said opening; and

translating means for translating said rearwardly translatable outer fairing and said translatable sleeve.

4,545,200

EXHAUST DEVICE OF A TWO-CYCLE ENGINE FOR A MOTORCYCLE

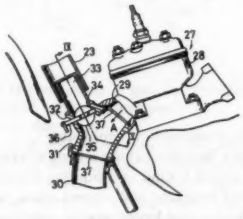
Ikuo Oike, Niiza, and Takahide Miyata, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,295

Claims priority, application Japan, Sep. 22, 1982, 57-143882[U]; Sep. 22, 1982, 57-143883[U]

Int. Cl.⁴ F02B *27/02*; F01N *7/00*

U.S. Cl. 60—314 **6 Claims**



1. An exhaust device for a motorcycle having two-cycle engine and a frame including a head pipe rotatably supporting a steering stem, a down tube extending downwardly from the head pipe, and a pair of cradle pipes branching off from the down tube and on which the engine is mounted, comprising;

a subchamber branching off from an exhaust pipe of the engine; and

a valve body located in an entrance portion of said subchamber and in which a valve is mounted to open and close the entrance portion of the subchamber in accordance with a speed of rotation of the engine, wherein said subchamber is disposed in a space in front of the engine and surrounded by said down tube and said pair of cradle pipes.

4,545,201

CONTROL ARRANGEMENTS FOR REGULATING THE SPEED OF A HYDROSTATIC ENERGY CONSUMER

Wolfgang Backe, Aachen; Franz Weingarten, Frechen, and Hubertus Murrenhoff, Aachen, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

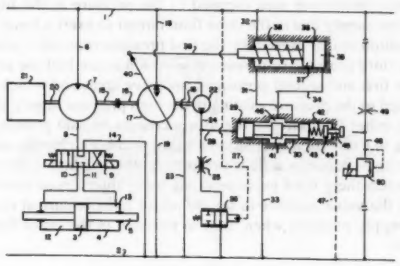
Filed Aug. 2, 1982, Ser. No. 404,508

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1981, 3130659

Int. Cl.⁴ F16H *39/46*

U.S. Cl. 60—420 **8 Claims**

1. Control arrangement for regulating the speed of movement of a hydrostatic energy consumer in which the ratio between pressure supplied and power on the output side is constant comprising a hydrostatic energy consumer having a constant ratio between power and pressure whose speed of movement is to be regulated, a high pressure hydraulic fluid supply capable of supplying several hydrostatic machines, a first hydrostatic displacement machine connected in series between the high pressure hydraulic fluid supply and the hydrostatic energy consumer, a second hydrostatic displacement machine mechanically coupled to the first hydrostatic machine, said second hydrostatic machine being adjustable with respect to its volumetric displacement per revolution, said second displacement machine being connected to the high pressure hydraulic fluid supply on one side, a low pressure hydraulic fluid line spaced from the high pressure supply, a connection between the second adjustable displacement machine and said low pressure line whereby fluid moves from the



high pressure supply to the low pressure line through the second adjustable displacement machine independently of the hydrostatic energy consumer and revolution per minute regulating means connected to said second adjustable displacement machine for adjusting the displacement thereof in accordance with both the speed of rotation of said second adjustable displacement means and of the first displacement means mechanically coupled thereto thereby controlling the pressure fluid going to the energy consumer.

4,545,202

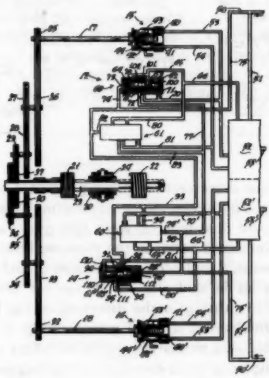
PRESSURE-REGULATING SYSTEM

David J. Linton, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 24, 1983, Ser. No. 545,043

Int. Cl.⁴ F15B *18/00*

U.S. Cl. 60—420 **11 Claims**



1. A pressure-regulating system for plural hydraulic motors which are both connected to a common torque-summing output device comprising: a first fluid circuit for one of said motors including a high pressure supply line and also having a high fluid pressure motor line and a fluid return line, a pressure-limiting valve connected to said high fluid pressure motor line and said return line and having a valve member urged in a direction to block communication therebetween; a second fluid circuit for the other of said motors including a second high

pressure supply line and also having a second high fluid pressure motor line and a second fluid return line, and a second pressure-limiting valve connected to said second high fluid pressure motor line and said second return line and having a valve member urged in a direction to block communication therebetween; each of said pressure-limiting valves having a first pressure-responsive area exposed to the pressure existing at a motor inlet port of the motor in the same fluid circuit, a second pressure-responsive area of the same area as the first pressure-responsive area exposed to the pressure in the high pressure supply line in the same fluid circuit to exert a force in opposition to that exerted by the first pressure-responsive area, and a third pressure-responsive area which is one-half the area of the first and second pressure-responsive areas and which is exposed to the pressure existing in the high pressure supply line in the other fluid circuit, the forces created by said pressures acting in a direction to position a valve member to block communication between a fluid pressure motor line and a return line when there is no pressure in the other fluid circuit and to cause the valve member to set the motor line pressure at one-half supply pressure when there is pressure in the other fluid circuit.

4,545,203

HYDROSTATIC DRIVE UNITS

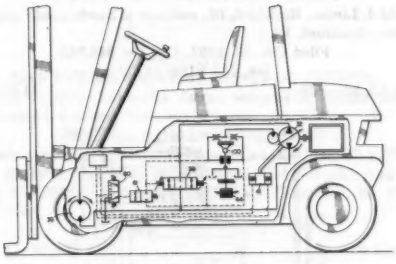
Horst Deininger, Hoerstein-Alzenau, and Burkhard Stuermer, Aschaffenburg, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 28, 1983, Ser. No. 517,917

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228360

Int. Cl.⁴ F15B *15/18*

U.S. Cl. 60—468 **19 Claims**



1. Hydrostatic drive unit for driving a motor vehicle comprising a pump, a hydraulic motor, connecting means including a pair of pressure fluid lines between said pump and motor, a branch line connected between the pressure fluid lines of the connecting means, a shut-off means located in said branch line, measuring means in said shut-off means for measuring the horizontal forces arising in the direction of the longitudinal axis of the vehicle, said shut-off means acting on the hydrostatic drive unit, said measuring means including a mass capable of being displaced in the direction of the longitudinal axis of the vehicle against a forcible stop, resilient means acting on said mass to position the same normally in a closed center position preventing flow through the branch line, said means being capable of movement in two directions from the center position on the longitudinal axis of the vehicle and in working connection with the shut-off element whereby during the exertion of force upon the forcible stop said mass acts on said shut-off element to control fluid flow in said connecting means through said branch line by permitting increased flow proportioned to increased force on the shut-off element.

4,545,204

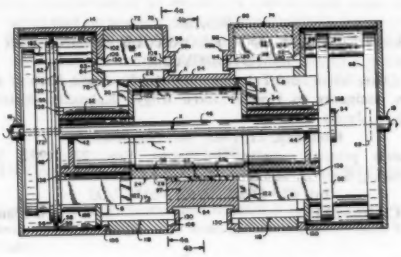
INFINITELY VARIABLE TANDEM TRANSMISSION

Brian L. Whalen, 365 Furrows Rd., Holbrook, N.Y. 11741

Filed Oct. 24, 1983, Ser. No. 544,711

Int. Cl.⁴ F16D *39/00*

U.S. Cl. 60—491 **9 Claims**



1. Hydraulic transmission comprising:

a. a stationary housing having a central axis;

b. cylinder means within said housing for dividing the interior thereof into first and second sides, said means being axially slidable and keyed against rotation;

c. spaced first and second identical cylindrical rotatable cage means mounted in mirror image of each other for rotation on said cylinder means within said first and second sides, respectively, of the interior of said housing;

d. first and second rotatable shafts along said central axis for engaging said first and second cage means, respectively, extending out of said housing;

e. each of said cage means having radial slots communicating with the outer surface of said cylinder means;

f. a radial vane in each of said slots forming a chamber in said slot with the outer surface of said cylinder means;

g. cam means formed in said housing for reciprocating each said radial vane as its cage means rotates thereby varying the depth of its chamber as its cage rotates;

h. an axial vane riding on said cylinder means extending into each slot in each said cage means for defining one end of the chamber in the axial direction formed in said slot; said housing including means to define the other end of said chamber in the axial direction;

i. means for supplying hydraulic fluid to said chambers whereby when said first rotatable shaft is driven by an external source of power said first cage means will rotate and pressurize the hydraulic fluid within chambers whose depths are decreasing;

j. means formed in said housing between said cage means for communicating pressurized chambers within said first cage means with chambers in said second cage means causing rotation of the latter, the second rotatable shaft delivering the output of said transmission; and

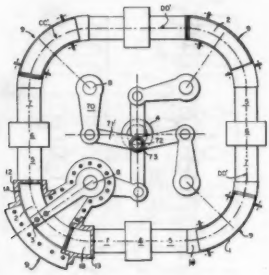
k. means to slide said cylinder means axially along with the axial vanes in said slots with respect to said housing thereby to adjust differentially the axial lengths of said chambers within said first and second cage means, respectively, so as to change in an infinitely variable degree the torque and speed ratios of the input and output of said transmission.

4,545,205

STIRLING CYCLE OR COMPRESSOR-TYPE THERMAL ENGINE HAVING A POWER SOURCE POSITIONED EXTERNALLY TO OR INTERNALLY TO ITS CYLINDERS

Jean Bras, Toulouse, France, assignor to Ste. Gaz de France, St. Denis, France

Filed Jan. 23, 1984, Ser. No. 572,850
Claims priority, application France, Jan. 24, 1983, 83 01128
Int. Cl.[4] F02G *1/04*
U.S. Cl. 60—525 **38 Claims**



1. A thermal engine using a gas for transferring energy therein, wherein said engine comprises:

(a) a plurality of chambers;

(b) a plurality of double-effect pistons, one of which is positioned in each of said plurality of chambers so as to reciprocate therein, wherein each chamber and double-effect piston together comprise an expansion phase side and a compression phase side of said chamber, wherein each piston comprises an arm, and wherein each expansion phase side of one chamber is positioned directly opposite a compression phase side of another chamber;

(c) means for connecting said plurality of chambers such that each expansion phase side of one chamber is in communication with a compression phase side of another chamber, wherein said connecting means comprises means for transmitting said gas from one side to another side due to reciprocation of said pistons;

(d) an output shaft adapted to undergo circular movement; and

(e) means for transforming said reciprocating motion of said pistons into circular movement of said output shaft.

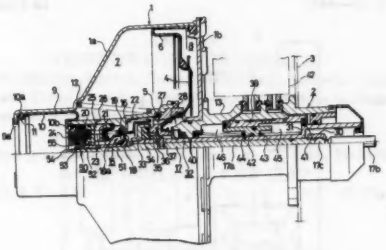
4,545,206

APPARATUS FOR CLEARANCE ADJUSTMENT IN BRAKE BOOSTER

Michio Kobayashi, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,636
Claims priority, application Japan, Jul. 11, 1983, 58-125826
Int. Cl.[4] B60T *13/60*
U.S. Cl. 60—554 **4 Claims**

1. For use in a brake booster including a shell having a front and a rear shell, a power piston slidably disposed within the shell, a valve mechanism disposed within a valve body formed as a shank portion of the power piston for controlling the opening or closing of a passage for fluid, a constant pressure chamber defined forwardly of the power piston and a variable pressure chamber defined rearwardly of the power piston, a master cylinder connected to the rear shell adjacent to the variable pressure chamber, an input shaft slidably extending through the master cylinder and mechanically coupled to the valve mechanism, a supply passage for supplying fluid to the valve mechanism from the front side of the power piston, a reaction disc disposed rearwardly of the valve mechanism for receiving a thrust from the power piston, an output shaft slidably fitted around the input shaft and mechanically coupled to a piston disposed within the master cylinder for transmitting a thrust from the power piston as received through the reaction disc to the piston within the master cylinder to produce a braking liquid pressure therein, and a reaction transmitting member disposed in opposing relationship with the reaction disc with a given clearance therebetween for transmitting a reaction force to the input shaft upon abutment thereof against the reaction disc; an apparatus for adjusting the clearance



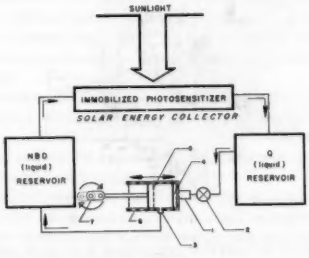
characterized in that the input shaft comprises a first section which is mechanically coupled with the reaction transmitting member and a second section on which a valve seat forming the valve mechanism is defined, the first and the second section being formed by separate members which are connected together in a manner to permit their relative postion to be adjusted, the both members projecting toward the front shell to permit their relative position to be adjusted through an opening formed in the front shell.

4,545,207

SOLAR ENERGY SYSTEM

Michael P. Neary, 409 E. Coronado #2, Santa Fe, N. Mex. 87501

Continuation of Ser. No. 74,423, Sep. 11, 1979, abandoned, and a continuation-in-part of Ser. No. 136,496, Apr. 3, 1980, Pat. No. 4,424,805, which is a continuation of Ser. No. 894,826, Apr. 10, 1978, abandoned. This application Jun. 9, 1981, Ser. No. 271,860
The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.
Int. Cl.[4] F01K *25/08;* F03G *7/02*
U.S. Cl. 60—645 **2 Claims**



1. The process of operating an engine, motor or the like, which comprises heating the work substance therein with a chemical energy-producing substance containing quadricyclene, by causing the catalytic release of heat from quadricyclene, passing said heat through a heat exchanger to said working substance to elevate the temperature of the same, causing said work substance to operate said engine.

4,545,208

METHOD OF OPERATING AN INDUSTRIAL FURNACE

Friedhelm Kühn, Mülheim, Fed. Rep. of Germany, assignor to Ruhrgas Aktiengesellschaft, Essen, Fed. Rep. of Germany

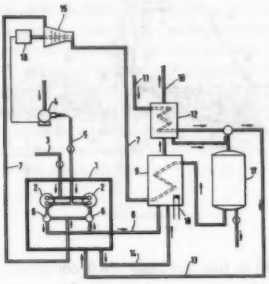
PCT No. PCT/DE83/00115, § 371 Date Feb. 29, 1984, § 102(e) Date Feb. 29, 1984, PCT Pub. No. WO84/00206, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 25, 1983, Ser. No. 589,113

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224571

Int. Cl.[4] F01K *17/00*

U.S. Cl. 60—648 16 Claims



1. The method of operating an industrial furnace which is heated by recuperator burners from which the exhaust gases are extracted via injectors, comprising:

extracting the exhaust gases from said burners via steam injectors,

exhausting the exhaust gas-steam mixture through a waste heat boiler to produce water vapor therein, and

supplying said water vapor to drive said steam injectors.

4,545,209

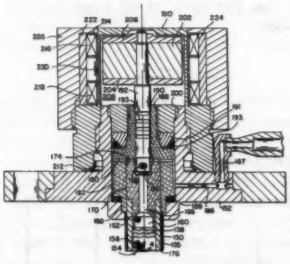
CRYOGENIC REFRIGERATION SYSTEM WITH LINEAR DRIVE MOTORS

Niels O. Young, Free Union, Va., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Jan. 17, 1983, Ser. No. 458,718

Int. Cl.[4] F25B *9/00*

U.S. Cl. 62—6 14 Claims



1. A cryogenic refrigerator comprising a gaseous working fluid which is alternatively compressed and expanded to cool a portion of the working fluid to cryogenic temperatures and a linear drive motor for driving a piston element in the refrigerator which acts on the working fluid in a thermodynamic refrigeration cycle, the linear drive motor comprising:

a permanent magnet armature fixed to the piston element;

a housing surrounding the permanent magnet armature and hermetically sealing the volume in which the armature reciprocates; and

a coil assembly surrounding the housing.

4,545,210

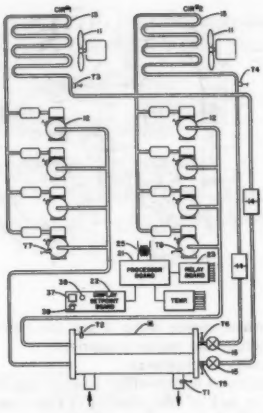
ELECTRONIC PROGRAM CONTROL FOR A REFRIGERATION UNIT

Richard G. Lord, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,331

Int. Cl.[4] F25B *45/00, 49/00*

U.S. Cl. 62—77 2 Claims



1. A method of programming the electronic processor control board of a refrigeration unit at the final assembly of the unit which comprises:

determining the physical characteristics of the refrigeration unit;

arranging a configuration header having a plurality of conducting wires therethrough on the processor control board;

assigning each of said plurality of conducting wires to a preselected input of a microprocessor;

electrically connecting the assigned conducting wire to an input of a microprocessor; and

selectively developing a binary code for each input of the microprocessor by allowing or not allowing a signal through each conducting wire to be impressed on the input of the microprocessor to program the microprocessor to the determined physical characteristics of the refrigeration unit.

4,545,211

COLD BOX FOR MOTOR VEHICLES

Ernst Gaus, Klammweg 72, D-7500 Karlsruhe 31, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,346

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1983, 3328120

Int. Cl.[4] B60H *3/04*

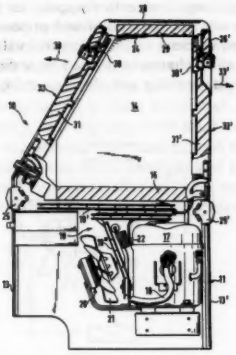
U.S. Cl. 62—115 20 Claims

1. A cold box for motor vehicles having an electrical power supply line grid comprising a motor connected to the electrical power supply line grid; a refrigeration compressor mechanically connected to the motor to be driven by the motor; a condenser connected to the refrigeration compressor to receive from the compressor pressurized refrigeration medium to be cooled;

a pedestal located between two seats, said seats being disposed adjacent to each other and parellel to each other in

a motor vehicle, said seats being provided with back cushions;

a cold chamber placed on the pedestal such that the front wall of the cold chamber corresponds approximately to the inclination of the back cushions of the seat; an evaporator disposed closely adjacent to the cold chamber



and fed with refrigeration medium by the condenser via an expansion provision to provide cooling to the cold chamber; and

door provision disposed at the cold chamber for allowing the cold chamber to be filled with goods or to be emptied of goods.

4,545,212

SUPER-HEAT DETECTOR FOR REFRIGERATING APPARATUS

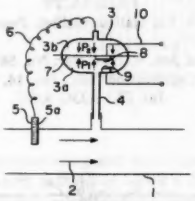
Sadafumi Noda, Isahaya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,270

Claims priority, application Japan, Jul. 29, 1983, 58-140299

Int. Cl.[4] F25B *41/00*

U.S. Cl. 62—129 **3 Claims**



1. A super-heat detector of refrigerant gas, which comprises:

(a) a semiconductor pressure sensor for detecting a pressure of the refrigerant gas in a conduit run for passing said refrigerant gas wherein said semiconductor pressure sensor is fitted to said conduit;

(b) a semiconductor temperature sensor for detecting a temperature of said refrigerant gas wherein said temperature sensor is fitted to said conduit and wherein said temperature sensor outputs an electrical signal; and

(c) an operational controller having one input for receiving the output of said temperature sensor and a second input for receiving the output of said pressure sensor wherein said controller converts an output signal from said semiconductor pressure sensor to a value corresponding to a saturation temperature of said refrigerant gas pressure, and produces an output signal corresponding to super-heat condition of said refrigerant gas by comparison between said corresponding value of the saturation temperature and said output from said semiconductor temperature sensor.

4,545,213

REFRIGERATOR FOR VEHICLE

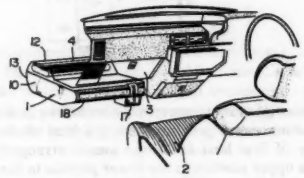
Kenichi Fujiwara, Kariya, Japan; Hikaru Sugi, Victoria, Australia, and Eiichi Hasada, Okazaki, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 6, 1984, Ser. No. 628,567

Claims priority, application Japan, Feb. 27, 1984, 59-36698

Int. Cl.[4] G05D *23/32*; F25D *17/02*

U.S. Cl. 6 R—158 **12 Claims**



1. A refrigerator for a vehicle having an air-conditioner including a refrigeration cycle with a refrigerant to be circulated therein, said refrigerator comprising:

a housing having a heat insulating structure;

a door openably mounted on said housing and cooperating therewith to define a refrigeration space;

a coldness accumulator disposed in said refrigeration space;

said refrigeration cycle including a first evaporator;

said coldness accumulator comprising a coldness storage medium, a second evaporator disposed in said refrigeration space and means supporting said coldness storage medium in heat exchange relationship to said second evaporator;

said second evaporator being adapted to be operatively connected to said refrigeration cycle;

means for detecting a level of accumulation of coldness in said coldness accumulator and emitting a signal representing a coldness accumulation level thus detected;

indicator means responsive to said signal to indicate the coldness accumulation level detected by said detecting means;

said refrigeration cycle further including a first refrigerant expansion means adjacent to an inlet of said first evaporator;

a second refrigerant expansion means adjacent to an inlet of said second evaporator;

an electrically operable valve means operative to selectively cause the refrigerant to flow from said refrigeration cycle to and through said second refrigerant expansion means and thus said second evaporator;

means comparing said signal with a reference signal and emitting a comparator output signal when the level of the coldness accumulation in said accumulator reaches a predetermined set level; and

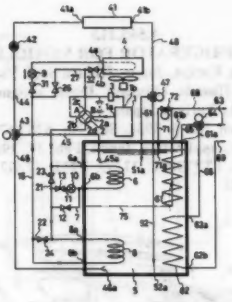
electric actuator means responsive to said comparator output signal to actuate said valve means so that the flow of the refrigerant to said second evaporator from said refrigeration cycle is stopped.

4,545,214

HEAT PUMP SYSTEM UTILIZABLE FOR AIR CONDITIONER, WATER SUPPLY APPARATUS AND THE LIKE

Teruo Kinoshita, Tokyo, Japan, assignor to Misawa Homes Co., Ltd., Japan

Filed Dec. 19, 1984, Ser. No. 683,649
Claims priority, application Japan, Jan. 6, 1984, 59-283
Int. Cl.[4] F25B *13/00, 27/02*
U.S. Cl. 62—160 **14 Claims**



1. A heat medium temperature controlling heat pump system which comprises a tank for storing a heat medium therein, a plurality of first heat exchange means arranged in sequence from the upper portion to the lower portion in the tank, second heat exchange means arranged outside said tank, a cooling medium circulating passage for connecting a plurality of said first heat exchange means to said second heat exchange means in series, means for forcibly circulating a cooling medium in said cooling medium circulating passage, means for reversing the flowing direction of the cooling medium in said cooling medium circulating passage, cooling medium expanding means connected in parallel to the portion of said cooling medium circulating passage between two adjacent upper and lower first heat exchange means, second cooling medium expanding means arranged in series in the portion of said cooling medium circulating passage between the lowermost first heat exchange means and the second heat exchange means, a first by-passing passage by-passing said second heat exchange means so that the cooling medium circulating passage in short-circuited, first valve means for selectively introducing the cooling medium into one of said first cooling medium expanding means and the portion of said cooling medium circulating passage parallel to said first cooling medium expanding means, and second valve means for selectively introducing the cooling medium into one of the first by-passing passage and said second heat exchange means.

4,545,215

REFRIGERATION APPARATUS

Hiroshi Inoue, Shizuoka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

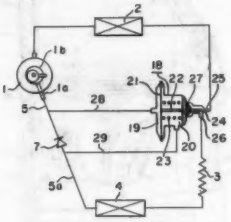
Filed May 18, 1984, Ser. No. 611,988
Claims priority, application Japan, May 23, 1983, 58-90265; May 23, 1983, 58-90266; May 23, 1983, 58-90267; Sep. 2, 1983, 58-136403[U]; Sep. 2, 1983, 58-161657
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—216 **1 Claim**

1. A refrigeration apparatus comprising a compressor, a condenser, a pressure-reducing device and an evaporator connected sequentially in a refrigeration loop which comprises:

a check valve placed in said loop between an outlet of said evaporator and an intake port of said compressor to prevent a refrigerant from flowing from the compression side to the evaporator side of said compressor;

a pressure signal transmission pipe having one end connected to an outlet of said check valve for applying a pressure corresponding to the refrigerant pressure at the outlet side of said check valve; and

a fluid control valve in said loop positioned at an inlet side of said pressure reducing device and communicated with another end of said pressure signal transmission pipe for controlling the refrigerant flowing to said inlet side of said pressure-reducing device in response to the refrigerant pressure in said another end of said pressure signal transmission pipe, wherein said fluid control valve has first and second pressure chambers defined by a diaphragm and a valve body for opening and closing a refrigerant pressure



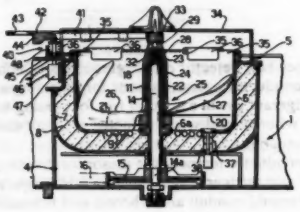
in said loop in response to movement of said diaphragm, said first pressure chamber being connected to said another end of said pressure signal transmission pipe and said second pressure chamber receiving a pressure at an inlet side of said check valve, and a second pressure signal transmission pipe having one end connected between said inlet side of said check valve and said outlet side of said evaporator and having another end connected to said second pressure chamber of said fluid control valve, whereby said fluid control valve opens and closes said loop depending on a pressure difference between said inlet side and said outlet side of said check valve.

4,545,216

MULTI-PURPOSE DEVICE INCORPORATING A FREEZING CYCLE, MORE PARTICULARLY FOR PRODUCING ICE CREAM AND SIMILAR FROZEN PRODUCTS

Alfredo Cavalli, 9, Via Galileo Galilei, Pessano Con Bornago, Milan, Italy

Filed Jan. 4, 1984, Ser. No. 567,946
Claims priority, application Italy, Jan. 14, 1983, 20467/83[U]
Int. Cl.[4] A23G *9/00*
U.S. Cl. 62—343 **11 Claims**



1. An apparatus for producing ice cream and similar frozen products from ingredients comprising a stationary freezing container for said ingredients having a longitudinal axis, a rotatable drive shaft disposed in said freezing container along said longitudinal axis and mounted for rotatable movement therein; two speed drive means operatively connected to said drive shaft for rotatably driving said drive shaft at a selected one of said two speeds; whipping blade shaft means rotatably

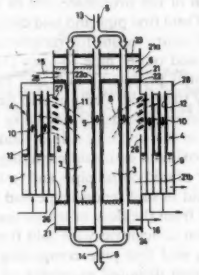
mountable on said drive shaft and having whipping blade means secured thereto for simultaneous rotation therewith, said whipping blade means on said rotatably mounted whipping blade shaft means being disposed near the bottom of said container, said whipping blade shaft means being rotatably driveable at a first high speed by said drive shaft means for rotating said whipping blade means at said first high speed for whipping said ingredients; and freezing blade shaft means rotatable and removably mountable on said drive shaft and having mixing blade means secured thereto near the inner side wall and bottom of said container and disposable to cover said whipping blade means when said freezing blade shaft means is removably mounted on said drive shaft means for rotatable drive thereby, said freezing blade shaft means being rotatably driveable at a second low speed by said drive shaft means for rotating said mixing blade means at said second low speed for freezing said ingredients after said high speed whipping of said ingredients by said whipping blade means.

4,545,217

STEAM GENERATING AND CONDENSING APPARATUS

Kazushige Nakao; Masaki Ikeuchi; Eiichi Ozaki, and Tsuneo Yumikura, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1984, Ser. No. 669,915
Claims priority, application Japan, Nov. 9, 1983, 58-211935
Int. Cl.⁴ F25B *15/00*
U.S. Cl. 62—476 **5 Claims**



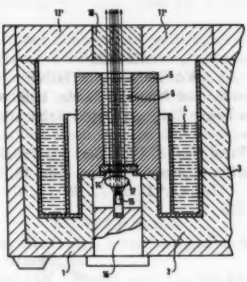
1. A steam generating and condensing apparatus having a steam generating chamber in which a diluted solution flowing from an absorption device and containing a refrigerant absorbed therein flows outside of the pipes of a steam generating heat exchanger to evaporate the refrigerant from the diluted solution with a hot fluid flowing through the pipes of the steam generating heat exchanger, and a steam condensing chamber in which the refrigerant steam supplied through a partition from the steam generating chamber is condensed by a steam condensing heat exchanger, wherein the improvement comprises a double-cylinder assembly composed of outer and inner cylinders, said inner cylinder being divided by a dispersing end plate into upper and lower chambers serving as a dispersing diluted solution pool and said steam generating chamber, respectively, said outer and inner cylinders jointly defining a space in which said steam condensing chamber is disposed, said partition having eliminators on an upper portion thereof, said dispersing diluted solution pool having a diluted solution inlet pipe, and said steam generating chamber having a concentrated solution outlet pipe in a lower portion thereof.

4,545,218

CRYOGENIC FIXATION APPARATUS

Klaus Neumann, Bexbach, Fed. Rep. of Germany, and Heinrich Kleber, Vienna, Austria, assignors to E. Reichert Optische Werke AG, Vienna, Austria

Filed Sep. 17, 1984, Ser. No. 651,385
Int. Cl.⁴ F25B *19/00*
U.S. Cl. 62—514 R **6 Claims**



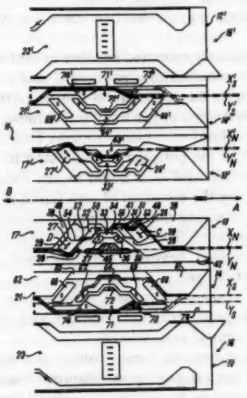
1. Cryogenic-fixation apparatus comprising a container for a cooling liquid means to cool said container, a window in the underside of said container, a light source and optical means for directing a beam of light upwardly through said window to illuminate the interior of the cooling bath.

4,545,219

SINGLE OR MULTI-CAM SYSTEM FOR FLAT-BED KNITTING MACHINES

Hermann Schmodde, Albstadt, Fed. Rep. of Germany, assignor to H. Stoll GmbH & Co., Fed. Rep. of Germany

Filed Aug. 28, 1984, Ser. No. 644,900
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334040
Int. Cl.⁴ D04B *7/10*
U.S. Cl. 66—70 **7 Claims**



1. A single or multi-cam system for flat-bed knitting machines having needle, jack and selector cam units arranged one beneath the other, the needle cam unit including at least one integrated knitting/transfer cam assembly for both carriage traverse and transfer directions, wherein:

(i) the knitting cam portion of said integrated knitting/transfer cam assembly includes spaced apart stitch cams, each having a leading lobe and a trailing lobe, said leading lobe

being higher than said trailing lobe for pretensioning the loops/stitches and said trailing lobe serving to transfer the loops/stitches; and

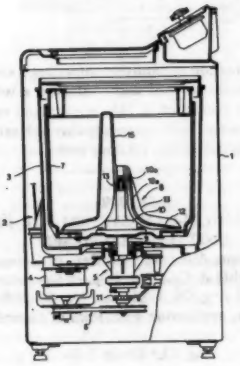
(ii) the transfer cam portion of said integrated knitting/transfer cam assembly includes a transfer receiving cam part associated with the stitch cams and at least one of said stitch cams.

4,545,220

WASHING MACHINE

Katsuyuki Ishida, and Naotaka Ikeda, both of Aichi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 8, 1983, Ser. No. 550,030
Claims priority, application Japan, Nov. 18, 1982, 57-202421
Int. Cl.[4] D06F *17/08, 17/10*
U.S. Cl. 68—133 **2 Claims**



1. A washing machine comprising:

tub means defining an interior area for holding liquid therein;

a pulsator rotatably mounted relative to said tub means and disposed in said interior area thereof, said pulsator including a skirt area having a raised central portion extending to a predetermined upper limit and defining a central axis of rotation, plural vane means radially extending from said upper limit to the periphery of said skirt to establish vortex flow within said liquid, and means fixed to said skirt for enhancing the agitation of said liquid in said tub, said agitation enhancing means defining a second axis parallel to and separated from said central axis and being upwardly extended beyond said uppermost limit of said central portion; and

drive means connected to said pulsator for rotating said pulsator in predetermined forward and reverse cycles about said central axis, wherein

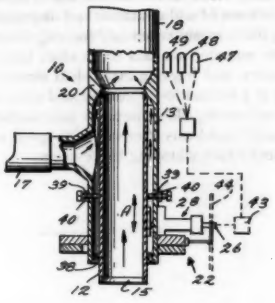
said agitation enhancing means rotates in a satellite fashion about said central axis upon rotation of said pulsator by said drive means to establish localized areas of highly turbulent flow within said vortex flow so that fabric articles will be randomly turbulently manipulated when enountering said turbulent flow and wherein said agitation enhancing means creates a force generally opposite said direction of vortex flow in the upper region of said tub means when said agitator enhancing comes into contact with said fabric articles to compress said fabric articles to facilitate the cleansing thereof.

4,545,221

ADJUSTMENT AND CLEANING OF THE VENTURI GAP IN A DYEING MACHINE

Winfield C. Daniel, and Richard K. Sitterding, both of Altavista, Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 21, 1983, Ser. No. 515,858
Int. Cl.[4] D06B *3/28*
U.S. Cl. 68—181 R **19 Claims**



1. In an apparatus for the liquid treatment of textile material in rope form: a first, textile material passing, pipe, having proximate and distal ends; an outlet pipe generally concentric and in line with said first pipe, and at least said proximate end of said first pipe disposed within said outlet pipe; a second, treatment liquid, inlet pipe, generally transverse to said outlet pipe, and opening into said outlet pipe at a portion thereof between said proximate and distal ends of said first pipe; a circumferential projection formed on the interior of said outlet pipe downstream of the proximate end of said first pipe, said proximate end of said first pipe and said circumferential projection forming a Venturi; means for reciprocating said first pipe with respect to said outlet pipe to vary the spacing between said circumferential projection and said first pipe proximate end, and thereby vary said Venturi; said first pipe reciprocating means comprising means for engaging said first pipe at a portion thereof on the opposite side of said second pipe from said first pipe proximate end; said engaging means: actuatable from the exterior of said outlet pipe; and isolated from the flow of treatment liquid in said second pipe and through said Venturi; and isolated from the flow of textile material through said first pipe; and non-concentric with said first pipe; said means for reciprocating said first pipe comprising a cam and a cam follower mechanism disposed exteriorly of said first pipe between said first pipe and the interior wall of said outlet pipe, and disposed between the distal end of said first pipe and the opening of said second pipe into said outlet pipe.

4,545,222

TEXTILE YARN CARRIER

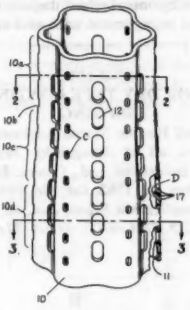
Karl H. Rost, P.O. Box 6783, Greenville, S.C. 29606

Continuation of Ser. No. 487,003, Apr. 21, 1983, abandoned.
This application Jan. 30, 1985, Ser. No. 696,851
Int. Cl.[4] D06F *17/00*
U.S. Cl. 68—198 **3 Claims**

1. A textile yarn carrier constructed of an open plastic shell having generally cylindrical configuration facilitating the passage of a liquid dye therethrough from the inside but being reduced adjacent at least one end sufficiently to permit stacking wherein an upper portion of each yarn carrier is nested within a lower portion of a next adjacent yarn carrier comprising:

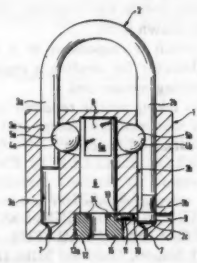
a plurality of generally axial apexes with valleys therebetween formed by undulations within the surface of the plastic shell;

said plastic shell being of generally uniform thickness;
a plurality of spaced openings in said plastic shell;
said generally axial apexes with valleys therebetween formed by undulations extending along said yarn carrier;
said apexes and valleys of the top of one yarn carrier serving as means guiding an upper portion of said one yarn carrier into nested relation with respective apexes and valleys aligned in a lower portion of a next adjacent yarn carrier;



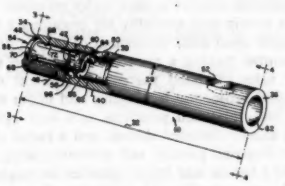
stop means carried inside said lower portion of a carrier limiting the amount to which said upper portion a yarn carrier may be pushed into said lower portion of another;
the apexes of the undulations being aligned in an axial direction such that the yarn carriers can be pushed into one another a predetermined amount forming nesting portions; and
spaced recesses being formed on the apexes of the respective yarn carriers to avoid jamming.

4,545,223
PADLOCK
Heikki Poutiainen, and Henrikki Malminen, both of Joensuu, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland
Filed Feb. 7, 1983, Ser. No. 464,467
Int. Cl.⁴ E05B 67/22
U.S. Cl. 70—38 A **20 Claims**



1. A padlock comprising:
a lock casing, a basically U-formed shackle slideable therein between a closed and an open position, said shackle having two legs of different length, of which at least one is provided with a locking notch;
a cylinder lock mechanism, operable by a key;
at least one locking member coacting with a guiding portion of a turnable member of said cylinder lock mechanism for locking said shackle to said lock casing, said locking member being movable dependent on the angular position of said guiding portion of said cylinder lock mechanism between a locking and a releasing position, the releasing position allowing said shorter shackle leg to slide out completely from said lock casing;
a retaining member attached to said lock casing for maintaining said cylinder lock mechanism properly fitted in said lock casing, said retaining member having a key receiving opening provided for the turning thereof with tool engageable recesses, the removal of said retaining member from said lock casing requiring turning of said retaining member around a longitudinal axis thereof in relation to said lock casing, and said retaining member having a recess; and
a blocking member dimensioned in its blocking position to be partly received in said retaining member recess and partly in an opening in said lock casing, thereby preventing the turning of said retaining member in relation to said lock casing, and said blocking member being removable from its blocking position when said shackle is in its open position.

4,545,224
BICYCLE LOCK
Michael S. Zane, Cambridge, Mass., assignor to KBL Corporation, Boston, Mass.
Filed Oct. 27, 1983, Ser. No. 545,832
Int. Cl.⁴ E05B 9/04
U.S. Cl. 70—39 **6 Claims**



1. A locking device for bicycles and the like, comprising:
(a) a U-shaped shackle and a tubular cross bar adapted to lock across the open end of said shackle;
(b) a replaceable cam-cylinder combination operatively mounted in one end of said tubular cross bar;
(c) a retaining member for securing said cam to said combination, replaceably mounting thereby said cam-cylinder combination in said one end of said tubular cross bar;
(d) said tubular cross bar being formed with two different sizes of internal diameter defining a shoulder against which said cam abuts, said cam and said retaining member being admitted into said tubular cross bar from one end thereof and said cylinder being admitted therein from the other end thereof;
(e) said cylinder being disposed within said tubular cross bar in a section defined by the smaller size of said two different sizes of internal diameters;
(f) said U-shaped shackle defining means for preventing said cylinder of said cam-cylinder combination from being replaceable when said cross bar is mated to said U-shaped shackle, and said cylinder being provided with a rim and said cross bar being formed with a counter-bore to accomodate said rim;
(g) said rim cylinder being operable by means of a flat key being insertable into and removable from said cylinder only when said cam-cylinder combination is in a locked position;
(h) said cylinder being provided with a locking member and said tubular cross bar being provided with a locking groove to accomodate said locking member;
(i) said tubular cross bar being provided with a pin to arrest

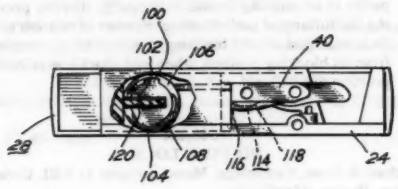
the rotational displacement of said cam between its two operative positions: said locked position and an unlocked position.

4,545,225

LATCH AND LOCK ASSEMBLY

Steven Mihojevich, Elkhart, Ind., assignor to Continental Industries, Inc., Elkhart, Ind.

Filed Aug. 19, 1983, Ser. No. 524,562
Int. Cl.⁴ E05B *65/52*
U.S. Cl. 70—71 **10 Claims**



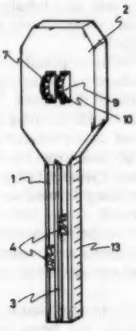
1. A latch and lock assembly for use with suitcases, briefcases and the like, comprising a lower member adapted to be secured to the case, an upper member secured to said lower member and having a lock cylinder disposed therein with a radially extending abutment thereon, said upper member being axially slidable relative to said lower member, a male member disposed within said assembly for engaging a female member on the case upon axial movement of said upper member, said male member having a ramp-like projection with oppositely beveled sides mounted thereon, a resilient means disposed against said projection for urging said upper member toward latched and unlatched positions, said lock cylinder having a keyhole axially disposed therein and a radial slot in said lock cylinder disposed parallel and communicating with said keyhole, and a bar on said lower member for engaging said cylinder and preventing axial movement of said upper member when said lock cylinder is in a locked position and for seating in said radial slot and keyhole to prevent entry of a key when said lock cylinder is in unlocked position.

4,545,226

COMBINATION KEY

Rafael Urrestarazu-Borda, Casa Gure-Pakea, Barrio Ayete, San Sebastian, Spain

Filed Dec. 29, 1983, Ser. No. 566,523
Claims priority, application Spain, Feb. 17, 1983, 270.406[U]
Int. Cl.⁴ E05B *19/18*
U.S. Cl. 70—411 **4 Claims**



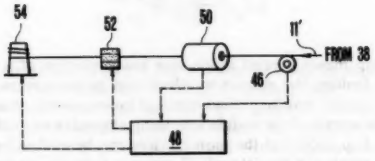
1. A combination key, comprising a hollow stem and an actuating body integrally formed with said stem, said stem defining in at least one of its sides a plurality of longitudinally extending slots, a plurality of teeth longitudinally slidably disposed in said slots, and means provided in the interior of said stem for moving said teeth longitudinally in said slots, so that said teeth can be positioned in accordance with the desired pattern, wherein said means for moving said teeth includes at least one chain disposed in the interior of said stem and extending into said actuating body, said teeth attached to said at least one chain, at least one control wheel disposed in said actuating body and in meshed engagement with said at least one chain.

4,545,227

APPARATUS FOR DRY TYPE CONTINUOUS WIRE DRAWING

Chuzoh Sudoh; Hyoji Hagita; Motoo Asakawa; Hiroshi Nagai, and Kenji Aihara, all of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 20, 1983, Ser. No. 505,844
Claims priority, application Japan, Jun. 18, 1982, 57-105011
Int. Cl.⁴ B21C *9/00, 43/04, 51/00*
U.S. Cl. 72—12 **6 Claims**



1. A dry type continuous wire drawing machine comprising:
a pay-off stand for supplying a wire to be drawn therefrom;
mechanical descaling means for removing scale from said wire;
lubricating surfacer treating means having an applying die for pressure-applying a powdered lubricating surfacer to the surface of said wire;
pre-die dry type lubrication treating means;
a drawing die for drawing the wire which has been subjected to the lubrication;
a surface flaw detector for detecting surface flaws on the drawn wire;
automatic repairing means for removing the flawed surface portion of said drawn wire;
a control unit which is responsive to a signal from said surface flaw detector for sending a repair signal to said automatic repairing means; and
take-up means for taking up the repaired wire, wherein the components of said machine except said control unit are consecutively arranged in series.

4,545,228

ROLL ECCENTRICITY CONTROL SYSTEM FOR A ROLLING APPARATUS

Terushige Yamaguti, Nabari; Toshinori Miki, Izumisano; Toshio Mannaka, Katsuta; Hiroshi Koyama, Hitachi, and Yukihiro Kawano, Katsuta, all of Japan, assignors to Hitachi, Ltd. and Nisshin Steel Co., Ltd., both of Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 551,911
Claims priority, application Japan, Nov. 15, 1982, 57-198939
Int. Cl.⁴ B21B *37/00*
U.S. Cl. 72—16 **6 Claims**

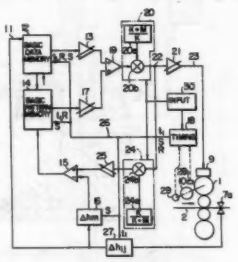
1. A roll eccentricity control system for compensating a variation of output thickness of a rolled material due to a roll eccentricity in a rolling apparatus in which the output thickness is controlled by controlling a roll gap of the rolling apparatus in accordance with a reduction position signal, said system comprising;
thickness deviation detection means for detecting a devia-

tion of the output thickness of the rolled material from a desired value thereof;

means for sequentially sampling and storing, during rolling operation of the apparatus, deviations of the output thickness of the rolled material for a plurality of sections which are devisions of one cycle period corresponding to one revolution of said roll;

means for sequentially calculating period average deviations based on averages of the deviations of the thickness sampled for at least one period and storing the period average deviations for the respective sections;

means for calculating differences between section average deviations for the respective sections derived from averages of the deviations of the thickness, for the corresponding sections, sampled for a plurality of periods and stored



as basic data and period average deviations for the respective sections, and storing the differences for the respective sections as a basic pattern;

means for reading out values of said basic data and said basic pattern for the respective sections, sequentially in order of the sections, at a controlled timing and combining said read-out values to produce roll eccentricity control signals for the respective sections; and

means for converting said roll eccentricity control signals for the respective sections to reduction position control siganls for the respective sections in accordance with characteristics of said rolling apparatus and said rolled material, said reduction position control signals being utilized for controlling the roll gap of said rolling apparatus so as to control the output thickness of said rolled material.

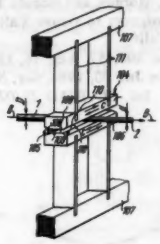
4,545,229

METHOD FOR MANUFACTURING MICROWIRE AND DEVICE FOR EFFECTING SAME

Alexandr V. Stepanenko; Vladimir G. Voitov, both of Minsk; Stepan S. Klimenkov, Vitebsk; Svyatoslav A. Bartashevich, and Viktor S. Karpitsky, both of Minsk, all of U.S.S.R., assignors to Belorussky Politekhnichesky Institut, U.S.S.R.

Filed Sep. 3, 1981, Ser. No. 302,429
Int. Cl.[4] B21B *1/16*
U.S. Cl. 72—73 **8 Claims**

1. A device for manufacturing microwire comprising: a body, and a die comprising two parts which interact with a microwire blank as the latter is drawn between them, each of the die parts having an entry portion, a working surface and an exit portion said two parts having said surfaces facing each other and arranged within the body for parallel and opposed reciprocation, means to reciprocate said die parts in the form of a shaft, comprising two parts which meet in a connection plane, said connecting plane extending at an acute angle to the axis of the shaft, each part of the shaft interacting with a respective die part, one part of the shaft being coupled to a rotary drive and one part of the shaft having means to shift it along the axis of the shaft, and springs having first portions secured



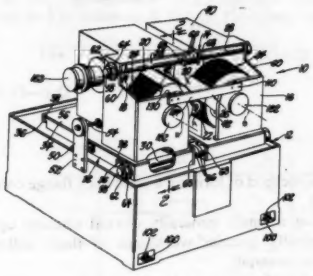
to the body and second portions which urge the die parts against the respective parts of the shaft.

4,545,230

ROTARY FORMING MACHINE HAVING TIE BAR CONNECTION

Harald N. Jungesjó, Rochester, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Filed Dec. 27, 1983, Ser. No. 565,287
Int. Cl.[4] B21B *31/04*
U.S. Cl. 72—108 **15 Claims**



1. A rotary-forming machine assembly comprising:

a lower base (12); a pair of spindle housings (14) including front (16) and rear (18) walls, said housings (14) movably mounted on the base (12) for movement toward and away from one another; a tool spindle (20) mounted between said front (16) and rear (18) walls of each of said housings (14), said tool spindles (20) rotatably supported by said walls (16, 18) for rotation about spaced axes (B) for forming a workpiece (22) therebetween including a tie bar connector (28) extending between and interconnecting said rear walls (18) and limiting the distance apart said rear walls (18) may move in response to the forming of a workpiece between said tool spindles (20); characterized by a deflection control bar (26) extending between and interconnecting said front walls (16) of said spindle housings (14) only for limiting the distance apart said axes (B) of said tool spindles (20) may move at said front walls (16), in response to the forming of a workpiece between said tool spindles (20).

4,545,231

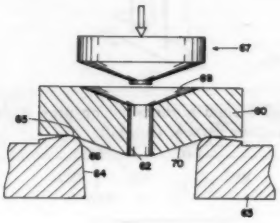
METHOD OF MANUFACTURING A WELD NECK FLANGE

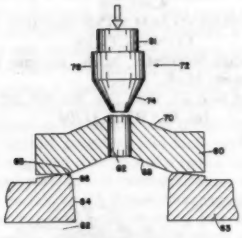
Walter L. Connolly, Moraga, and Harold T. Ray, Walnut Creek, both of Calif., assignors to Grove Valve & Regulator Company, Oakland, Calif.

Division of Ser. No. 408,457, Aug. 16, 1982, abandoned. This application Jul. 30, 1984, Ser. No. 635,655

Int. Cl.[4] B21D *28/02*

U.S. Cl. 72—335 2 Claims





1. The method of forming a weld neck flange comprising the steps of:

forming a small, generally coaxial circular opening in a generally circular workpiece of thick mill-rolled steel plate material;

heating said workpiece to glowing;

placing said workpiece, with one flat annular surface up, on an open female die;

said female die having a top annular support surface and a generally cylindrical cavity;

then, pressing a blunt convex circular member against the top surface of said workpiece while supported on said annular support surface so that said top surface of the workpiece is formed concave and the opposite surface is formed convex;

inverting said workpiece so that said convex opposite surface is up;

forcing through said heated workpiece a male die having an entry nose that enters freely through said circular opening and a profile gradually increasing in diameter to engage around the edges thereof and shear-form the steel closely surrounding said opening downward below the bottom surface of said workpiece;

said profile of said male merging with a trailing cylindrical portion thereof of substantially the internal diameter to be formed.

4,545,232

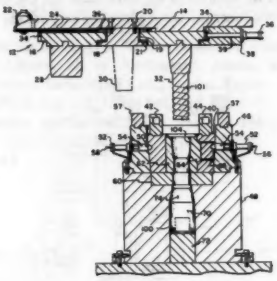
METHOD AND APPARATUS FOR PERFORMING MULTIPLE CLOSED AND SEMI-CLOSED OPERATIONS ON AN OPEN DIE PRESS

Wayne A. Martin, Wilkins Township, Allegheny County, and Justin G. Modic, Richland Township, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 387,999, Jun. 14, 1982, abandoned. This application Nov. 19, 1984, Ser. No. 672,522

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—356 2 Claims



1. A method of producing valve pots utilizing an open die press which has a vertically reciprocable crosshead and a bottom riser for support of a die assembly underneath said crosshead, said method comprising:

placing a heated workpiece in a split die portion of a bottom die assembly mounted in stationary position under said crosshead, said split die having a bottom opening smaller than the lateral dimensions of said workpiece in communication with the cavity in said die,

upsetting said workpiece by successively lowering the crosshead to sequentially drive a plurality of punches into the workpiece, said punches being part of a rotatably indexable top punch assembly secured on the underside of said crosshead,

closing said bottom opening in the split die during upsetting of the workpiece by raising a bottom upset member located in a bottom upset member assembly mounted on the bottom riser of said press,

punching a hole through the workpiece after upsetting by lowering the crosshead and the top punch assembly, and

lowering the bottom upset member so that the opening in said split die is exposed during the punching step to permit a punchcore of metal from the workpiece to be disposed of through said opening in the split die.

4,545,233

MULTITOOL PUNCHING APPARATUS

Rolf Peddinghaus, Deterbergerstr. 25, 5828 Ennepetal, Fed. Rep. of Germany

Filed Nov. 8, 1983, Ser. No. 549,927

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1983, 3241844

Int. Cl.[4] B21D *22/00;* B21J *13/00*

U.S. Cl. 72—404 6 Claims

1. An apparatus for punching a workpiece, the apparatus comprising;

a stationary frame;

a longitudinal row of horizontally spaced and upwardly facing different dies stationarily fixed on the frame generally below a horizontally elongated punching station;

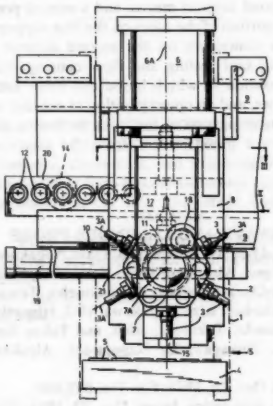
at least one horizontal and stationary rail fixed on the frame;

a punch carriage displaceable horizontally along the rail generally above the station;

a turret rotatable about a horizontal and transverse turret axis on the carriage and carrying a plurality of radially outwardly directed different punches angularly spaced about the turret axis and each operable only with a respective one of the dies;

positioning means operatively connected between the carriage and the frame for displacing the carriage longitudinally and horizontally through a plurality of positions in each of which the turret axis is directly above one of the dies;

indexing means for angularly displacing the turret about its axis synchronously with the longitudinal and horizontal displacement of the carriage through positions in each of



which one of the punches is facing down in the station toward the respective die, the indexing means including

a stationary horizontal rack fixed to the frame;

a shaft centered on the turret axis and carrying the turret; and

a gear fixed on the shaft and meshing with the rack and of such diameter relative to the angular spacing of the punches about the turret axis that when the carriage moves horizontally the turret is automatically synchronously rotated to align each of the punches directly over the respective die; and

actuator means for vertically displacing the turret and its axis on the punch carriage when one of the punches is above and facing down in the station at the respective die and thereby punching a workpiece resting on the die.

4,545,234

LEVER-ACTUATED TONGS

Klaus Schnellmann, Niederweningen, Switzerland, assignor to Stapex AG, Wohlen, Switzerland

Filed Jan. 16, 1984, Ser. No. 571,371

Claims priority, application Switzerland, Jan. 25, 1983, 407/83

Int. Cl.[4] B21D *7/06*

U.S. Cl. 72—410 **10 Claims**

7. A lever-actuated tong device, comprising:

two pivotable operating handles;

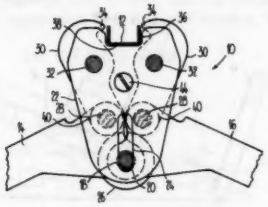
means defining a substantially central pivot axis about which there are pivotably mounted said at least two pivotable operating handles;

two jaw levers cooperating with said two pivotable operating handles;

a respective pivot means for pivotably mounting a respective one of said jaw levers at a related one of said operating handles;

means defining at least one fulcrum axis about which there are pivotably mounted both of said jaw levers in a substantially fixed relationship to one another;

first support means mounted on said means defining a substantially central pivot axis;



second support means mounted upon each of said respective pivot means; and

said second support means being supported by said first support means throughout the entire pivotal operation of said two pivotable operating handles.

4,545,235

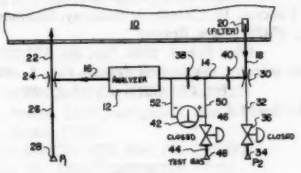
GAS ANALYZER WITH ASPIRATED TEST GAS

Daniel C. Barnett, Concord Township, Lake County, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 14, 1984, Ser. No. 609,673

Int. Cl.[4] G01D *18/00*

U.S. Cl. 73—1 G **6 Claims**



1. A method of operating a gas analyzer for analyzing a sample gas from a test space, comprising:

supplying the sample gas to be analyzed at a selected flow rate to the gas analyzer over a probe extending into the test space and over an input line connected between the probe and the analyzer;

discharging the sample gas from the analyzer over an output line;

equalizing a flow in the input line with a flow in the output line so as to stop the supply of sample gas to the analyzer; and

supplying a test gas to be used in calibrating the analyzer at the selected flow rate to the analyzer over the input line whereby test gas is discharged over the output line;

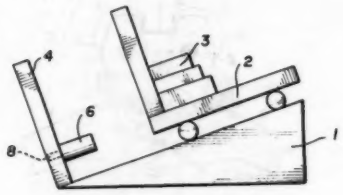
the sample gas at the selected flow rate supplied by powering a sample aspirator connected to the output line; and

the flow in the input and output lines equalized by powering a test gas aspirator connected to the input line.

4,545,236
DEVICE FOR SIMULATING STRESS ON PACKAGES DURING COUPLING OF RAILCARS

Mark T. Turczyn, Cheverly, Md., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 15, 1984, Ser. No. 620,815
Int. Cl.[4] G01M 7/00
U.S. Cl. 73—12 9 Claims

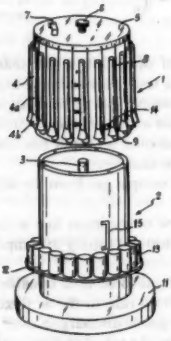


1. An apparatus for simulating railcar coupling shock comprising
   a. an inclined ramp;
   b. a first transverse wall connected to the lower end of said ramp;
   c. package holding means on said ramp for rolling down said ramp into said wall; wherein said wall and package holding means have opposing surfaces;
   d. a rigid, hollow cylinder which is longitudinally crushable in an accordion-like manner, said cylinder having at least one open end;
   e. means to temporarily attach said cylinder to one of said opposing surfaces to extend outward therefrom in the direction of the other of said opposing surfaces so that said cylinder is crushed therebetween when said package holding means rolls down said ramp into said wall; and wherein one of said opposing surfaces includes orifice means aligned with an open end of said cylinder to provide for egress of air from said cylinder when said cylinder is crushed.

4,545,237
APPARATUS FOR BLOOD ANALYSIS

Gérard Poncept, 10, Chemin de Dalibray, Gaillonnet par Serain-court, 95450-Vigny, France

Filed Feb. 1, 1984, Ser. No. 575,927
Claims priority, application France, Feb. 2, 1983, 83 01644
Int. Cl.[4] G01N 15/04, 33/48
U.S. Cl. 73—61.4 10 Claims

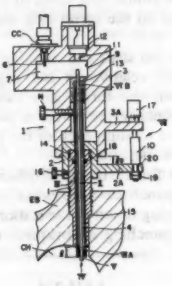


1. Blood analysis apparatus for determining sedimentation rates comprising first support means, a plurality of graduated tubes open at both ends, said tubes being mounted vertically and spaced apart on said first support means, said tubes each having a tubular body portion having a predetermined interior cross-sectional area and a lower portion extending a predetermined length downwardly from the tubular body portion and having an interior of a cross-sectional area greater than that of the tubular body portion at all lengths downward from said tubular body portion to provide a lower portion of enlarged section, second support means, a plurality of blood sample containers being of a size such that the lower portion of the tubes can be inserted therein, said containers being mounted vertically and spaced apart on said second support means, a plurality of sealing and flow causing means on said first support means engaging in the lower portion of respective tubes, said first and second support means being movable with respect to each other between a first position in which the tubes on the first support means are vertically spaced from the containers on the second support means, and a second position in which the lower portion of the tubes on the first support means are in respective containers on the second support means, means for moving said sealing and flow causing means between a lower position in which blood can enter said lower portion of the tubes, and an upper position in contact with the interior of said lower portion of the tubes to force a predetermined quantity of a blood sample from the containers upwardly into the tubes.

4,545,238
MICROWAVE AND LUMINOUS PROBE

Masao Kinoshita, 41-3, Aza Yokomichi, Oaza Nagakute, Nagakute-cho, Aichi-gun, Aichi-ken; Teruo Yamanaka, 1756-2, Aza Hosoguchishita Oaza Hirabari, Tempaku-cho, Tempaku-ku, Nagoya-shi, Aichi-ken; Kizo Hayakawa, 41-2, Higashiyashiki, Takayokosukamachi, Tokai-shi, Aich, and Takao Sugimoto, 148, Takabata, Nakagawa-ku Nagoya-shi, Aichi-ken, all, Japan

Filed Dec. 21, 1983, Ser. No. 563,800
Claims priority, application Japan, Dec. 23, 1982, 57-233048
Int. Cl.[4] G01M 15/00
U.S. Cl. 73—117.3 14 Claims



1. A microwave and luminous probe for use in a system for detecting the piston position in an internal combustion engine and the light emitted in a combustion chamber thereof on the basis of a microwave signal and a luminous signal comprising:
   a hollow cylindrical case body which is fitted into a hole bored through the wall of the internal combustion engine and connected to the combustion chamber;
   metal tubular internal and external conductors which are coaxially inserted within said case body, said internal and external conductors having different diameters from each other in the ratio of from 1:1.5 to 1:4;
   an annular passage defined by an annular space formed between said internal and external conductors and serving as microwave transmission means and optical transmission means; and

dipole antenna means comrising a metal tube forming said internal conductor protruded from said annular passage in the range of from ¼ to 3/8 of the wavelength of the microwave, and an annular opening formed at an end of said annular passage;

whereby the microwave propagated through said annular passage is transmitted from said annular opening and said protruded metal tube of said dipole antenna means into said combustion chamber and the microwave reflected from said combustion chamber is received by said protruded metal tube and said annular opening, and the light emitted by combustion in said combustion chamber is received by said annular opening and transmitted through said annular passage.

4,545,239

METHOD AND APPARATUS FOR CONTROLLING THE QUALITY OF TIRES

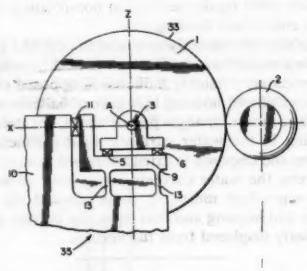
Günther Himmler, Darmstadt, and Friedrich Wenz, Seeheim-Jugenheim, both of Fed. Rep. of Germany, assignors to Gerb. Hofmann GmbH & Co. KG, Pfungstadt, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,294

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231852

Int. Cl.⁴ G01M *17/02*; G01L *5/16*

U.S. Cl. 73—146 **15 Claims**



2. Apparatus for controlling the quality of tires, said apparatus comprising:

a. means for rotatably supporting a tire;

b. drum means supported for rotation and adapted to be in pressure engagement with the periphery of a tire;

c. means to urge said tire and said drum means into contact engagement at a predetermined contact pressure;

d. drive means for driving one of said tire and said drum means at a predetermined speed;

e. support means for rotatably supporting said drum means, said support means including a bearing unit and a bearing bridge carried by said bearing unit, said bearing bridge supporting said drum means;

f. first force measuring means carried on said bearing bridge for measuring dynamic force components of said rotating tire;

g. second force measuring means supported between said bearing bridge and said bearing unit for measuring static force components of said rotating tire; and

h. analyzing circuit means connected to said first and said second force measuring means for determining the forces and moments of said rotating tire.

4,545,240

APPARATUS FOR ASCERTAINING THE ADHESION FACTOR OF A ROAD SURFACE

Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

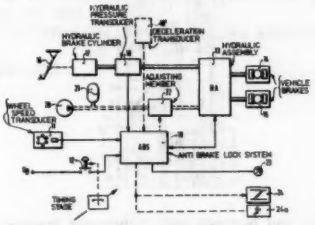
PCT No. PCT/DE82/00006, § 371 Date Aug. 19, 1982, § 102(e) Date Aug. 19, 1982, PCT Pub. No. WO82/04019, PCT Pub. Date Nov. 25, 1982

Continuation of Ser. No. 413,357, Aug. 19, 1982, abandoned. This PCT application Jan. 7, 1982, Ser. No. 705,420

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119153

Int. Cl.⁴ B10G *19/10*

U.S. Cl. 73—146 **19 Claims**



1. Apparatus to determine the adhesion factor of wheels on a vehicle on a road surface, wherein the vehicle has power assisted brakes (14, 15);

means (16, 17; 20, 21, 22; 13) for applying braking pressure to the brakes; and

means (10, 11) for determining slip (S) of a wheel or wheels of the vehicle with respect to the road surface,

comprising, in accordance with the invention,

means (12) for applying an increasing test braking pressure (p_1, p_2, p_3, p_4) to a wheel or wheels of the vehicle;

slip determination means (10) responsive to peripheral wheel speed and to vehicle speed and determining wheel slip upon application of the test pressure to the brakes, and generating an output signal (23) if, when the slip exceeds a given

value upon application of test pressure to the brakes of the vehicle, the test pressure has not exceeded a predetermined level.

4,545,241

IN-HOLE MOTOR TACHOMETER

Robert L. Alder, Irvine, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Jun. 25, 1982, Ser. No. 392,292

Int. Cl.⁴ G01V *1/40*; E21B *47/00*

U.S. Cl. 73—151 **5 Claims**

1. An in-hole tachometer suitable for use with fluid-driven in-hole turbines comprising:

(a) a tachometer housing;

(b) a throttle valve mounted in said housing, including a valve orifice and a valve member cooperating with said orifice;

(c) a tachometer assembly mounted in an assembly housing within said tachometer housing, said tachometer assembly including:

(1) an input shaft rotatably mounted in said assembly and extending into said assembly housing,

(2) an output shaft connected at one end of said shaft to the valve member and extending from said assembly housing,

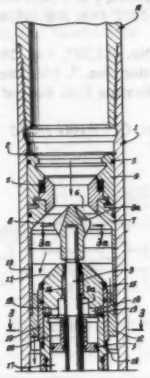
(3) a cam mechanism including a cam follower and a cam connected to said input shaft,

(4) a speed reducing mechanism connecting said input shaft to said cam,

(d) a free-floating piston in said assembly housing,

(e) lubricant passageways for introduction of lubricating oil into the assembly housing on one said of said free-floating piston,

(f) fluid passageways in said assembly housing from said



orifice and between said tachometer housing and said assembly housing to the end of said tachometer housing, and

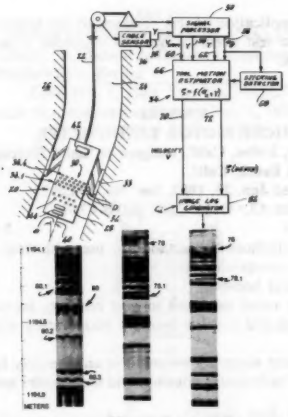
(g) inlet ports to said assembly housing underneath the said piston.

4,545,242

METHOD AND APPARATUS FOR MEASURING THE DEPTH OF A TOOL IN A BOREHOLE

David S. K. Chan, Bethel, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 27, 1982, Ser. No. 437,059
Int. Cl.⁴ E21B *49/00*
U.S. Cl. 73—152 **21 Claims**



1. A method for determining the depth of a tool suspended from a cable inside a borehole penetrating an earth formation comprising the steps of:

deriving a measurement of cable depth of the tool from a measurement of the length of the cable from which the tool is suspended;

deriving a measurement of the acceleration of the tool along the borehole axis;

estimating the depth of the tool from the cable depth and acceleration measurements;

sensing a motionless tool in the borehole; and

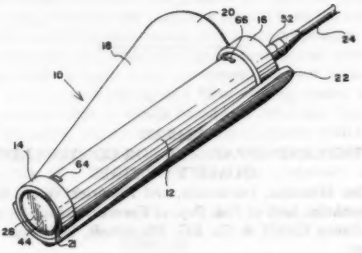
modifying the tool depth estimating step at least during the interval the tool is sensed to be motionless so as to maintain the tool depth estimate constant while the tool is motionless.

4,545,243

NONROTATING CURRENT METER HOUSING

Shale J. Niskin, 3415 Chase Ave., Miami Beach, Fla. 33140

Filed Jan. 23, 1984, Ser. No. 572,800
Int. Cl.⁴ G01W *1/00*
U.S. Cl. 73—170 A **4 Claims**



1. A current meter for use in a body of water, comprising:

said current meter being of the type wherein the angle of said current meter relative to the vertical allows for measurement of water currents in the body of water,

a housing,

a support cable rigidly secured in non-rotating relationship to an end of said housing,

a pair of sleeves rotatably mounted to opposed ends of said housing and exteriorly disposed to said housing;

said sleeves are rotatably mounted at opposed exterior end portions of said housing by a pair of ballbearing races,

appendage means having a pair of wings, for stabilizing said housing in the water currents, rigidly attached to said sleeves and disposed to extend outward from said housing, whereby the water currents in the body of water cause said appendage means to rotate around the relatively stable said housing and thus cause the current meter to be angularly displaced from the vertical.

4,545,244

ULTRASONIC FLOW METER

Yoshichiro Yasuda, Tokyo, and Seio Satoh, Chiba, both of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Dec. 11, 1980, Ser. No. 215,374
Claims priority, application Japan, Dec. 16, 1979, 54-163007
Int. Cl.⁴ G01F *1/66*
U.S. Cl. 73—195 **19 Claims**

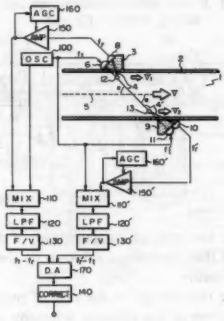
1. A Doppler-shift flow meter for use in measuring the velocity and/or rate of flow of a flowing fluid, said flow meter comprising:

(a) means for generating an oscillatory electric signal having a frequency in the range of ultrasonic frequency,

(b) a first transducer unit including a first ultrasonic transmitter having a first sending direction and a first ultrasonic receiver disposed close to said first ultrasonic transmitter and having a first receiving direction which forms an angle of substantially zero with said first sending direction for detecting a Doppler shifted signal having a frequency higher than the frequency of the input signal to said first ultrasonic transmitter,

(c) a second transducer unit spaced from said first transducer unit with the fluid therebetween, and including a second ultrasonic transmitter having a second sending direction

and a second ultrasonic receiver disposed close to said second ultrasonic transmitter and having a second receiving direction which forms an angle of substantially zero with said second sending direction for detecting a Doppler shifted signal having a frequency lower than the frequency of the input signal to said second ultrasonic transmitter,



(d) means for obtaining a first Doppler shift ($+\Delta f_1$) defined by the difference in frequency between the input and output signals of said first transducer unit and for obtaining a second Doppler shift ($-\Delta f_2$) defined by the difference in frequency between the input and output signals of said second transducer unit, and

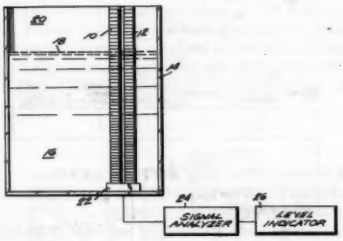
(e) signal emphasizing means for producing the difference between said first and second Doppler shifts ($+\Delta f_1+\Delta f_2$), thus substantially doubling the value.

4,545,245

LIQUID LEVEL SENSOR USING SONIC METHODS

David L. Sharp, Bristol, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Nov. 9, 1983, Ser. No. 550,087
Int. Cl.⁴ G01F *23/00*
U.S. Cl. 73—290 V **12 Claims**



1. In combination, a system for detecting liquid level in a vessel comprising:

elongated transmit and receive waveguide means spaced from one another by a preselected dimension for respectively transmitting sonic waves of a predetermined wavelength and receiving discrete pulses of said waves refracted between said transmit and receive waveguide means, each of said transmit and receive waveguide means including means defining surfaces forming plural paired lenses axially separated from one another for refracting said pulses in time phase relationship between said transmit and receive waveguide means at substantially right angles relative thereto when said liquid occupies said space therebetween, said discrete pulses being returned by said receive waveguide means in said time phase relationship and being determinative of said liquid level in said vessel; and

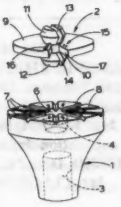
transducer means for transmitting said sonic waves through said transmit waveguide means and for receiving said discrete pulses returned by said receive waveguide means whereby said returned pulses are indicative of said liquid level in said vessel.

4,545,246

TIRE PRESSURE INDICATING DEVICE

John E. Starmer, Colegate, England, assignor to Metro Products (Accessories & Leisure) Limited, Oxted, England

PCT No. PCT/GB81/00269, § 371 Date Aug. 12, 1983, § 102(e) Date Aug. 12, 1983, PCT Pub. No. WO83/02091, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 14, 1981, Ser. No. 532,033
Int. Cl.⁴ G09F *9/00*
U.S. Cl. 116—315 **5 Claims**



1. A tire valve cap with tire pressure indicating means, said cap comprising a body component for connection to a pneumatic tire valve, said body component having a a series of digits thereon; a second component bearing a digit on each of two opposed faces thereof; and means whereby said second component can be releasably coupled to said body component in either of two mutually inverse orientations in which one or the other of said digit-bearing faces is exposed; said coupling means permitting said second component when coupled to said body component in either of those orientations to be displaced relative to said body component for bringing the exposed digit on said second component into reading combination with any selected one of said digits on said body component thereby to display a plural-digit pressure value.

4,545,247

BALANCE WORK SUPPORT AND CHUCK

Louis D. Wilson, and Patrick Jones, both of Folsom, Calif., assignors to Drive Line Service, Inc., West Sacramento, Calif.

Filed Sep. 27, 1983, Ser. No. 536,358
Int. Cl.⁴ G01M *1/04*
U.S. Cl. 73—473 **9 Claims**

1. A balancing station for use in a work station for working on workpieces or the like, said work station having a frame including a support bed, a tailstock, mounted on said support bed, a headstock mounted on said support bed, and spaced from said tailstock,

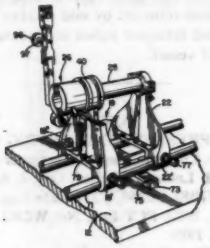
a means in said frame for slidably moving said headstock toward said tailstock,

strobe light means mounted on said work station for determining the movement of the central longitudinal axis of a workpiece,

the tailstock or headstock comprising a vertical generally planar member having a concave support mounted thereon and adapted to receive a bearing assembly, and

said bearing assembly having an outer shell containing bearings set between an inner race and an outer race,

wherein said radius of curvature of said concave support is different from the radius of curvature of said outer shell,



said outer shell of said assembly rotating within the curve of said concave support during rotation of a workpiece supported by said bearing assembly.

4,545,248

ULTRASONIC THICKNESS GAUGE

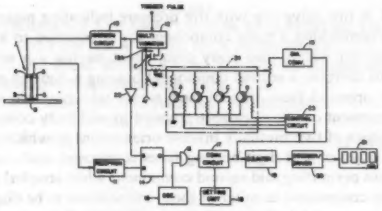
Toyohiko Kitada, and Takanori Arioka, both of Tokyo, Japan, assignors to Kabushiki Kaisha Tokyo Keiki, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,496

Claims priority, application Japan, Jun. 16, 1983, 58-108299; Jun. 16, 1983, 58-108300; Dec. 29, 1983, 58-249657

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—597 **3 Claims**



1. An ultrasonic thickness gauge comprising:

a split-type probe to send and receive ultrasonic waves through a material board to be measured;

a zero point calibration circuit to delay the zero point by a specified delay time from the transmission timing;

a measuring circuit to obtain the thickness of said board by counting clock pulses for a duration from the said zero point to a receiving timing;

and that is characterized in that it also includes:

a counter to count, within a specified range, the clock pulses applied to the board thickness of the material to be measured during each previous measurement performed by using the preset zero point; and

a zero point adjusting circuit to vary the zero point of the zero point calibration circuit in proportion to the count value of said counter.

4,545,249

ACOUSTICAL POSITION GAGE

Istvan M. Matay, No. Royalton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Sep. 6, 1983, Ser. No. 529,805

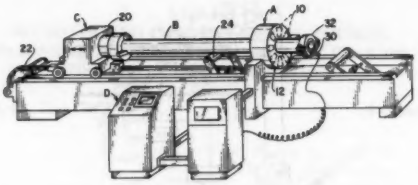
Int. Cl.[4] G01N *29/04*

U.S. Cl. 73—597 **6 Claims**

1. A method of determining a relative position of acoustically coupled objects including a workpiece undergoing relative movement, the method comprising:

transmitting an acoustic wave from a transmission point along one of the objects;

monitoring the acoustic wave at a monitoring point along the one object, one of the transmission and monitoring points being at a preselected point on the one object and the other of the transmission and monitoring points being movable in a fixed relationship to the other object;



measuring the rate of propagation of said acoustic wave through the workpiece relative to the movement of the objects; and,

correlating the change in the rate of propagation with relative position of the objects, whereby changes in the relative position of the objects are acoustically measured.

4,545,250

MEASURING APPARATUS UTILIZING SPECTRUM PROFILE

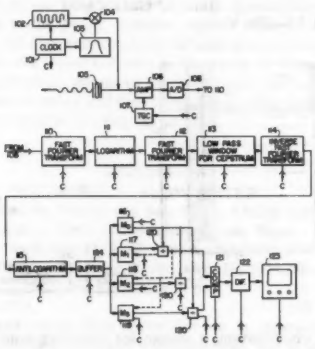
Hirohide Miwa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1984, Ser. No. 590,883

Claims priority, application Japan, Mar. 18, 1983, 58-45396

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—602 **14 Claims**



1. An apparatus utilizing the profile of a travelled power spectrum of a received signal wave of pulses transmitted through or reflected in an object, corresponding to an originally incident pulse having a predetermined power spectrum, to measure the characteristics of said object, said apparatus comprising:

processing means for reducing the scalloping of the travelled power spectrum of said received signal wave;

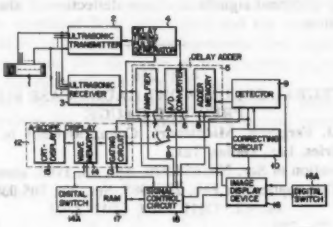
recovery means for deriving the travelled power spectrum with the reduced scalloping; and

extracting means for extracting information on the characteristics of said object from the derived power spectrum.

4,545,251
ELECTRONIC SCANNING TYPE ULTRASONIC NON-DESTRUCTIVE TESTING APPARATUS

Kuniharu Uchida, Fujisawa; Satoshi Nagai, and Ichiroh Komura, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 8, 1983, Ser. No. 511,938
Claims priority, application Japan, Jul. 8, 1982, 57-118907
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—631 **14 Claims**



1. An ultrasonic non-destructive testing apparatus of the electronic scanning type comprising:

transmitter means for producing exciting pulses in response to a predetermined timing pulse;

a probe coupled to said transmitter means, having a plurality of transducers for transmitting ultrasonic waves, in a calibration mode, into a calibrating member having known defective portions and for receiving the echoes from the known defective portions, and in a test mode, into a body to be tested and for receiving the echoes from unknown defective portions of the body;

signal processing means coupled to said probe for processing said echoes received by said probe to generate an echo signal;

means for obtaining reference correcting data for correcting amplitude attenuations of echoes from the known defective portions of said calibrating member and also for obtaining interpolating data for interpolating the reference correcting data in a beam propagation direction and a scan direction;

means coupled to said signal processing means for correcting amplitude attenuations of the echoes from the unknown defective portions of the body by using said reference correcting data and interpolating data; and

display means coupled to said correcting means for displaying a wave with regard to said body on the basis of the corrected echo signal.

4,545,252
APPARATUS FOR THE DETERMINATION OF CONTACT STRESSES IN PRESTRESSED TIRED (SHRINK-FITTED) TOOLS

Mihail T. Marinov; Lyubomir T. Petkanchin; Georgi I. Pushev; Georgi T. Kostov; Mitko M. Mihovski, and Valentina A. Manolova, all of Sofia, Bulgaria, assignors to Institute po Metaloznanie i Technologia na Metalite, Sofia, Bulgaria

Filed Sep. 6, 1983, Ser. No. 533,207
Claims priority, application Bulgaria, Sep. 16, 1982, 57976
Int. Cl.⁴ G01N *29/04*
U.S. Cl. 73—633 **4 Claims**

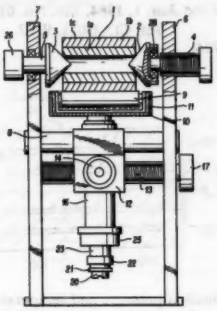
1. An apparatus for the determination of contact stresses in prestressed tired (shrink-fitted) tools, comprising:

a base having two coaxial and opposingly rotatable mounted supports, one of which is fastened to a rotatable axle, while the other is fastened to a screw by means of a bearing, and which are respectively mounted in two opposite parallel plates;

a tank containing an aromatic medium disposed between the plates;

an axially-movable first guide sleeve fastened to the bottom of the tank; the guide sleeve having a first bore in which sensing means are operatively mounted; the sensing means being operatively connected to a measuring system;

two parallel guides forming a connection between the parallel plates and on which the base is suspended;



means within the parallel guides adapted to position the tank bidirectionally with respect to the tired tool;

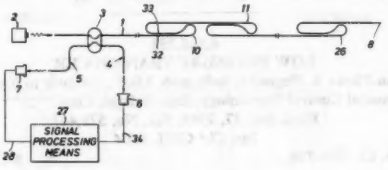
means within the axially-movable guide sleeve adapted to position the sensing means in a vertical direction with respect to the tank; and

means within the tank adapted to maintain a contact distance between the tank and the surface of the tired tool.

4,545,253
FIBER OPTICAL MODULATOR AND DATA MULTIPLEXER

Kenneth Avicola, Kingwood, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Continuation-in-part of Ser. No. 527,713, Aug. 29, 1983, abandoned. This application Apr. 5, 1984, Ser. No. 596,889
Int. Cl.⁴ G02B *5/14*
U.S. Cl. 73—655 **22 Claims**



1. A data gathering system comprising:

an optical main fiber having a first and a second end and including a core and cladding material;

means for transmitting into the first end of the main fiber an interrogating light pulse which propagates in a first direction along the main fiber;

a modulator formed on said main fiber, said modulator comprising an optical fiber segment held substantially parallel to a first section of said main fiber in a manner so that said segment and said main fiber are separated by a distance which is variable in response to variations in an incident external signal, said modulator further comprising means for diverting a return portion of said interrogating light pulse having intensity which varies in response to the distance between said segment and said main fiber, so that the return portion propagates in the main fiber in a direction opposite said first direction; and

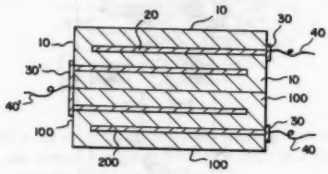
means optically coupled to said main fiber for detecting said return portion.

4,545,254

MATERIALS AND METHODS FOR PRESSURE AND TEMPERATURE SENSORS AT CRYOGENIC TEMPERATURES

William N. Lawless, Westerville, and C. Frederick Clark, Jr., Columbus, both of Ohio, assignors to CeramPhysics, Inc., Westerville, Ohio

Filed Jun. 1, 1984, Ser. No. 616,345
Int. Cl.⁴ G01L *9/12*
U.S. Cl. 73—714 **14 Claims**



11. A combination pressure and temperature sensing device for use at cryogenic temperatures comprising first and second pairs of electrodes having first and second layers of dielectric material therebetween, respectively, said dielectric material consisting essentially of pyrochlore ferroelectric ceramic having the formula:

$$(Cd_{1-x}M_x)_2(Nb_{1-y}M'_y)_2O_7,$$

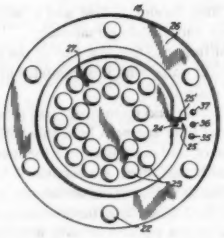
wherein x and y are numbers in the range of from 0 to 1, M is selected from the group consisting of Pb, Ca, Sr, Ba, and mixtures thereof, and M' is selected from the group consisting of Ta, Sb, and mixtures thereof, said first pair of electrodes and said first layer of dielectric material therebetween forming the pressure sensing portion of said device and wherein M, M', x and y are chosen such that the dielectric constant of said first layer of dielectric material is essentially temperature independent below 15 K., and said second pair of electrodes and said second layer of dielectric material therebetween forming the temperature sensing portion of said device, and wherein M, M', x, and y are chosen such that the dielectric constant of said second layer of dielectric material varies proportionally with temperature in the range of 0 to 15 K.

4,545,255

LOW PRESSURE TRANSDUCER

Jean-Pierre A. Pugnaire, Arlington, Mass., assignor to Environmental Control Technology, Inc., Bristol, Conn.

Filed Jan. 17, 1984, Ser. No. 571,443
Int. Cl.⁴ G01L *9/04*
U.S. Cl. 73—726 **6 Claims**



1. A pressure transducer for measuring pressures on the order of 1.5 to 5 inches of water comprising:

a. a housing having integral means for transmitting electrical signals;

b. an elastomeric barrier formed with a convolution connected at its periphery to the housing to form a fluid tight barrier;

c. a sensing element formed of a material substantially stiffer than the material of the elastomeric barrier and comprising an annulus immovably mounted in the housing, a movable paddle bonded to the elastomeric barrier so as to deflect upon the application of pressure to the elastomeric barrier, and a narrow connecting neck joining the paddle to the annulus; and

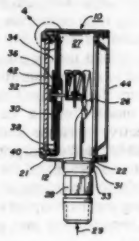
d. a strain gauge system located on the connecting neck and electrically connected to the integral means for transmitting electrical signals to detect deflection of the sensing element.

4,545,256

INTEGRAL SOLID FRONT GAUGE CASE FOR A PRESSURE GAUGE

Walter J. Ferguson, Middlebury, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 485,920, Apr. 18, 1983, abandoned. This application Feb. 25, 1985, Ser. No. 705,038
Int. Cl.⁴ G01L *7/04*; G01P *1/02*
U.S. Cl. 73—738 **3 Claims**



1. In a pressure gauge including a pressure sensitive element operably responsive to changes in fluid pressure to which it is connected, an indicator mechanism displaced by operation of said element for providing an indication of pressure value of the connected fluid and a transparent crystal supported in a superposed protective relation to said indicator mechanism, a solid front gauge case for housing said element and said indicating mechanism comprising:

(a) sheet metal construction of an annular outer wall;

(b) a solid front wall of sheet metal construction integral with said annular outer wall and positioned internally of said outer wall between said element and said indicator mechanism in the diametral plane of said outer wall;

(c) an annular flange defined in a joining relation between said annular outer wall and said solid front wall and extending peripherally about the front face of said outer wall for providing the case support for said crystal;

(d) said annular outer wall having an axial extent terminating rearwardly of said element so as to define by its internal diameter a rear opening thereat in which to receive a closure element; and

(e) a closure element for the rear of said annular outer wall affording relief of overpressure from within said case.

4,545,257

ELECTROMAGNETIC FLOW METER

Toyofumi Tomita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1983, Ser. No. 535,401
Claims priority, application Japan, Sep. 30, 1982, 57-171879
Int. Cl.⁴ G01F *1/60*
U.S. Cl. 73—861.17 **6 Claims**

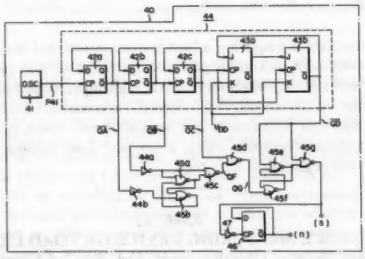
1. An electromagnetic flow meter comprising:

a flow meter main body which receives a first control signal,

controls a first switch to produce a square wave exciting current according to the first control signal, supplies the exciting current to an exciting coil for generating a magnetic flux, applies the magnetic flux to an electrically conductive fluid and takes out a voltage, induced in the electrically conductive fluid, as a flow rate signal by using a pair of electrodes;

means having a second switch, which receives the first control signal, amplifies the flow rate signal output from the flow meter main body and a signal obtained by inverting the flow rate signal from the flow meter main body and controls the second switch to select alternately between the amplified flow rate signal and the amplified inverted flow rate signal according to the first control signal every time the direction of the exciting current changes, thus outputting a sample signal;

a pulse width modulation circuit having a third switch, which receives the sample signal and a second control



signal, turns the third switch on every time the direction of the exciting current changes so as to sample the sample signal according to the second control signal, and produces a pulse signal with a width corresponding to the sampled value;

a timing control circuit which generates the first control signal to control said first and second switches in such a way that the frequency of the exciting current and the sample signal becomes one of the commercially available frequencies, either 50 Hz or 60 Hz, divided by an even number and generates the second control signal to control said third switch in such a manner that the sampling time for the sampling operation becomes the reciprocal of the other commercially available frequency; and

means which measures the pulse width of the pulse signal produced by the pulse width modulation circuit and detects the flow rate of the electrically conductive fluid based on the measured pulse width.

4,545,258

CIRCUIT WITH ADJUSTABLE AMPLITUDE AND ROLLOFF FREQUENCY CHARACTERISTICS

Thomas P. Coursolle, St. Paul, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Jul. 5, 1983, Ser. No. 510,953

Int. Cl.[4] G01F *1/32*

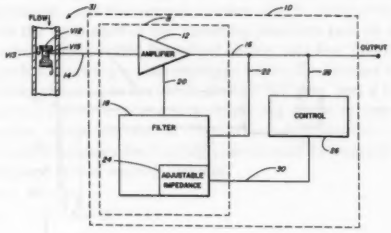
U.S. Cl. 73—861.22 **20 Claims**

1. An electrical circuit for providing an output signal having a frequency representative of an input signal which has a fundamental frequency which varies responsive to a parameter and noise components at frequencies other than the fundamental frequency, the circuit comprising:

amplifier means having an adjustable amplitude response for providing the output signal as a function of the input signal;

filter means coupled to the amplifier means for filtering the output signal and at least partially determining the amplitude response of the amplifier means, the filter means having an adjustable rolloff frequency characteristic with an adjustable rolloff;

first adjustable impedance means for adjusting the amplitude response of the amplifier means and the rolloff frequency characteristic of the filter means as a function of a control signal so that the rolloff frequency is substantially equal to the fundamental frequency; and



control means for providing the control signal to the first adjustable impedance means to decrease the amplitude response and increase the rolloff frequency when the fundamental frequency increases and to increase the amplitude response and decrease the rolloff frequency when the fundamental frequency decreases.

4,545,259

ULTRASONIC MEASURING APPARATUS

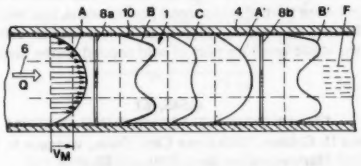
Hans-Erik K. Jensen, Åbenrå; Niels Abildgaard, Nordborg, and Steen H. Nielsen, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 3, 1983, Ser. No. 538,203

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239770

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.28 **13 Claims**

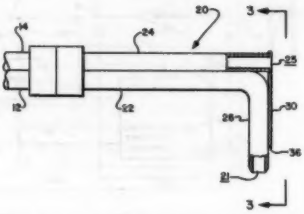


1. An ultrasonic measuring apparatus, comprising, a measuring tube, two ultrasonic converters at opposite ends of said tube defining an ultrasonic signal measuring path therebetween, said converters being used alternately as transmitter and receiver to produce and receive upstream and downstream ultrasonic signals, at least two axially spaced inserts in said tube for changing the velocity profile of a medium flowing through said tube relative to said ultrasonic signal measuring path so that the average of said upstream and downstream ultrasonic signals is substantially proportional to the mean flow velocity of said medium flowing through said tube, said inserts having flow-through sections which are radially divergent relative to said measuring path, and said inserts each having an axially extending dimension represented as a thickness on the order of 0.5 mm to 1.0 mm.

4,545,260
APPARATUS FOR MEASURING FLUID FLOW RATE IN A TWO-PHASE FLUID STREAM

Thomas K. Benton, and James R. Seay, both of Birmingham, Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 20, 1984, Ser. No. 622,511
Int. Cl.⁴ G01F *1/46*
U.S. Cl. 73—861.65 **5 Claims**



1. Apparatus for measuring fluid flow rate in a stream of fluid flowing through a flow pssage wherein the fluid comprises a gaseous fluid containing liquid droplets entrained therein, said apparatus comprising:

a. first probe means insertable into the fluid stream for sensing the total pressure thereof, said first probe means having a port therein adapted to face directly upstream into the fluid stream upon insertion of the first probe means into the fluid stream;

b. second probe means insertable into the fluid stream downstream of said first probe means for sensing the static pressure thereof, said second probe means having a port therein adapted to face normal to the direction of flow of the fluid stream upon insertion of the second probe means into the fluid stream;

c. pressure differential indicating means in communication with said first and second probe means for providing a representation indicative of the fluid flow rate of said fluid stream through the flow passage; and

d. plate means adjoining said first and second probe means and extending in the plane of the static pressure port of said second probe means from a point adjacent the total pressure port of said first probe means in a downstream direction to a point adjacent and downstream of the static pressure port of said second probe means, said plate means having an opening therein in flow communication with the static pressure port of said second probe means.

4,545,261
SHAFT TORQUE MEASURING SYSTEM

Vernon D. Gebben, Oklahoma City, Okla., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 477,033
Int. Cl.⁴ G01L *3/10*
U.S. Cl. 73—862.33 **2 Claims**

1. A measuring system for determining the torque of a slowly rotating shaft, comprising:

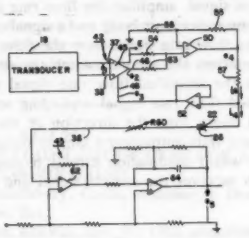
(a) transducer means mounted on said shaft for producing an output voltage signal proportional to the shaft's torque,

(b) a voltage-to-current converter circuit coupled to said transducer means for converting said output voltage signal to a proportional current signal, said circuit being contained in a housing carried by said shaft,

(c) a brush and ring assembly mounted on said shaft and coupled to said converter circuit for transmitting said current signal from said shaft to a monitor station,

(d) a current-to-voltage converter located at said monitor station and coupled to said brush and ring assembly for converting said current signal to a voltage signal that is proportional to the torque of said slowly rotating shaft, and

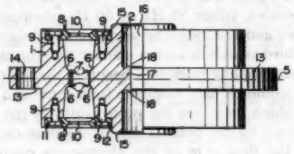
(e) said voltage-to-current converter circuit including an instrumentation amplifier coupled to said transducer means for amplifying said output voltage signal, a unity gain voltage follower coupled to the output of said instrumentation amplifier, a load resistor connected between the output of said unity gain voltage follower and said brush and slip ring assembly, and a high input impedance voltage follower which is coupled between said load resistor and said instrumentation amplifier and which provides a voltage feedback signal from said load resistor to said instrumentation amplifier.



4,545,262
FORCE MEASURING DEVICE OR LOAD CELL

Reimar Hellwig, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Hottinger Baldwin Measurements, Inc., Framingham, Mass.

Filed Oct. 27, 1983, Ser. No. 545,839
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241850
Int. Cl.⁴ G01L *1/22*
U.S. Cl. 73—862.65 **16 Claims**

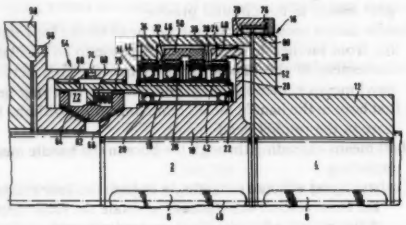


1. A load cell having a central plane and a main axis extending perpendicularly to said central plane to provide a substantially linear characteristic relative to loads applied to the load cell perpendicularly to said central plane and being substantially non-sensitive to any other loads, comprising an integral deforming body including a central hub member, an outer ring, and a number of radially extending stems for carrying strain gage elements, said stems integrally interconnecting said hub and ring to form said deforming body extending axially in opposite directions and symmetrically away from said central plane so that said central plane forms a plane of symmetry, said radial stems having a given maximum axial thickness in the direction of said main axis, said deforming body having an axial length corresponding at least to three times said maximum axial thickness for providing said substantially linear characteristic, said central hub member comprising concentric ring means with at least one axially outwardly facing crowned surface (**15, 18**) for concentrically applying a force to be measured by said load cell, to said concentric ring means forming part of said central hub member.

4,545,263
GEARBOX

Kurt G. Fickelscher, Frankenthal, Fed. Rep. of Germany, assignor to Balcke-Dürr AG, Ratingen, Fed. Rep. of Germany

Filed Mar. 30, 1983, Ser. No. 480,495
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211616
Int. Cl.⁴ F16H *33/00, 1/28, 3/44;* F16D *11/06*
U.S. Cl. 74—640 15 Claims

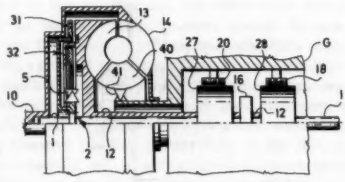


1. A gearbox having a first clutch-hub formed with gear-teeth, a hollow wheel coaxial with said first clutch-hub and having gear-teeth, a second clutch-hub to which said hollow wheel is non-rotatably connected, a planetary gear at least partially meshing with the gear-teeth of said first clutch-hub and of said hollow wheel, a transmission shaft mounted on said first clutch-hub between said first clutch-hub and said hollow wheel, an adjusting device for adjusting said transmission shaft so that said first clutch-hub and said hollow wheel rotate selectively at different predetermined rotation speeds and in synchronism, wherein said first clutch-hub comprises a radially outward internal gear defining an annular space, said transmission shaft and planetary gear projecting at least partly into said annular space, and wherein said radially outward internal gear is non-rotatably connected to said first clutch-hub by a radial connecting flange, and said radial connecting flange closes one axial end of said annular space.

4,545,264
AUTOMATIC DIFFERENTIAL TRANSMISSION GEAR

Antonín Hau; Jirí Srubar, both of Prague, Czechoslovakia; Jurij K. Esenovskij-Laskov, and Olgert I. Giruckij, both of Moskva, U.S.S.R., assignors to Ustav pro vyzkum motorovych vozidel, Prague, Czechoslovakia

Filed Sep. 15, 1982, Ser. No. 418,587
Claims priority, application Czechoslovakia, Sep. 15, 1981, 6810-81
Int. Cl.⁴ F16H *47/08*
U.S. Cl. 74—688 5 Claims

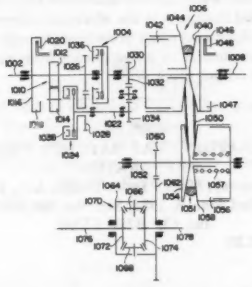


1. Automatic differential transmission gear comprising a speed reducing gear box with a reduction planetary gear and a collecting planetary gear, the gear box having a first and a second input shaft, the first input shaft being connected with the reduction planetary gear, the second input shaft being connected with the collecting planetary, the automatic differential transmission gear having an output shaft and an input shaft the input shaft of the reduction planetary gear being connected with the input shaft of the transmission gear, the input shaft of the collecting planetary gear being adapted to be selectively connected with the input shaft of the automatic differential transmission gear by means of a connecting element, said connecting element between the input shaft of the collecting planetary gear and the input shaft of the automatic differential transmission gear comprising two friction clutches, the first friction clutch being connected with the input shaft of the collecting planetary gear so as to take part in its rotational movement, and the second friction clutch being connected with the input shaft of the collecting planetary gear by way of a selectively operated freewheel device, said first first friction clutch comprising a plate arranged between a bearing surface fixedly attached to the input shaft of the gear, and a bearing element fixedly attached to a supporting piston mounted in a carrier, while the second friction clutch comprises a plate arranged between the bearing element and an inserted piston mounted in said bearing element.

4,545,265
HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE V-BELT TRANSMISSION

Keiju Abo, Yokosuka; Sigeaki Yamamuro, Zushi; Yoshikazu Tanaka; Haruyoshi Kumura, both of Yokohama, and Hiroyuki Hirano, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 20, 1983, Ser. No. 543,839
Claims priority, application Japan, Oct. 22, 1982, 57-184625
Int. Cl.⁴ B60K *41/12, 41/16*
U.S. Cl. 74—868 5 Claims



1. In a hydraulic control system for a continuously variable V-belt transmission for a vehicle having an engine, the continuously variable V-belt transmission having a transmission mechanism including a driving pulley, a driven pulley, a V-belt running over both pulleys and a starting clutch which, when engaged, transmits an engine rotary power to the driving pulley,

a shift control valve means for controlling the distribution of fluid pressure to both pulleys to vary a reduction ratio between the driving and driven pulleys;

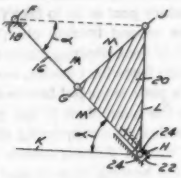
means for generating a driving pulley signal indicative of a revolution speed of the driving pulley;

a maximum reduction ratio maintaining valve means responsive to said driving pulley signal for setting the reduction ratio between the driving and driven pulleys at the largest reduction ratio irrespective of the state of said shift control valve, to thereby facilitate starting the vehicle.

4,545,266
STRAIGHT LINE LINKAGE

John H. Brems, 2800 S. Ocean Blvd.-Apt. 16-D, Boca Raton, Fla. 33432

Filed Jul. 19, 1982, Ser. No. 399,465
Int. Cl.[4] F16H *21/44*
U.S. Cl. 74—103 8 Claims



1. A mechanical linkage system having a pivot point output connection which moves along a true straight output path, comprising:

(a) a supporting frame,

(b) a first link member containing a first pivot point connecting said first link member to said frame and a second pivot point displaced from said first pivot point by a first distance,

(c) a rigid bellcrank member containing three non-colinear pivot points, comprising:

(1) a center pivot point connected to said second pivot point on said first link member,

(2) a guide pivot point separated from said center pivot point by a equal to said first distance,

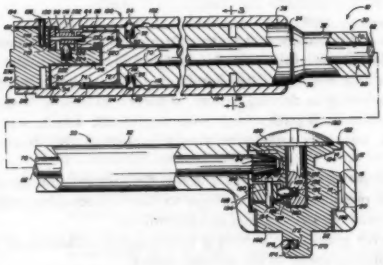
(3) an output pivot point separated from said center pivot point by a distance also equal to said first distance, and

(d) means for guiding said guide pivot point along a true straight line along a reference axis, where said reference axis is a straight line defined by a specific reference position of said linkage in which said first and second pivot points on said first link member and said guide pivot point on said bellcrank member are colinear and lie on said reference axis, and, when said linkage is in the aforesaid reference position, a line drawn from said guide pivot point to said output pivot point is perpendicular to a line drawn from said first pivot point to said output pivot point.

4,545,267
COMBINATION GEAR RATCHET WRENCH APPARATUS

Warren R. Shumway, 806 E. Todd, Tempe, Ariz. 85283

Filed Mar. 5, 1984, Ser. No. 586,304
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.29 5 Claims



1. Combination gear ratchet apparatus, comprising, in combination:

first ratchet head means, including

a first bore and

a first ring gear in the bore;

front ratchet drive means, including

a cylindrical block disposed in the first bore,

first actuator pawl means adapted to matingly engage the first ring gear in the first ratchet head means for controlling the direction of rotation of the front ratchet drive means,

drive means extending out of the first ratchet head means for matingly engaging a socket to be rotated,

a circular groove, and

gear means in the circular groove;

handle means secured to the ratchet head means for rotating the front ratchet drive means in response to an oscillating movement of the handle means when the first actuator pawl means is matingly engaged with the first ring gear;

a first bore in the handle means communicating with the first bore in the ratchet head means;

shaft means extending through the bore in the handle means, including

a bevel gear adapted to matingly engage the gear means of the front ratchet drive means to rotate the front ratchet drive means when the shaft means is rotated, and

second pawl means; and

sleeve means disposed about the handle means remote from the ratchet head means, and movable longitudinally on the handle means, and including

a second bore for receiving a portion of the handle means and a portion of the shaft means,

a second ring gear in the second bore and adapted to matingly engage the second pawl means for rotating the shaft means in response to rotation of the sleeve means,

wrench flats adapted to be secured to a wrench for rotating the sleeve means and the shaft means to rotate the front ratchet drive means when the gear means and the bevel gear of the shaft means are engaged,

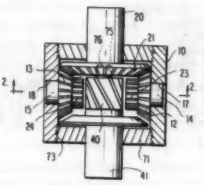
means for connecting the sleeve means and the shaft means together for joint axial movement relative to the handle means and the front ratchet drive means to matingly engage and disengage the bevel gear of the shaft means and the first ring gear, and

means for securing together the handle means and the sleeve means to prevent relative rotation when the bevel gear of the shaft means is disengaged from the gear means.

4,545,268
COMPACT TORQUE CONVERTER TOOL

William C. Stuckey, 1503 Virginia St., E. Charleston, W. Va. 25311

Filed May 31, 1984, Ser. No. 615,639
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.31 10 Claims



1. A compact torque converter for tools and the like comprising, in combination,

an annular housing,

an input torque member,

a bevel crown gear on said input torque member and coaxial with said annular housing,

bevel pinion gear means journeled for rotation in said hous-

ing and having an axis transverse to the axis of said annular housing,

a first coupling gear on the axis of and driven with said beveled pinion gear means,

a worm-helical gear journaled for rotation in said annular housing about an axis transverse to the axis of said annular housing and spaced from the axis thereof,

a second coupling gear integral with said worm gear and drivingly engaged with said first coupling gear for coupling rotary movements of said bevel pinion gear means to said worm gear,

an output torque member, and

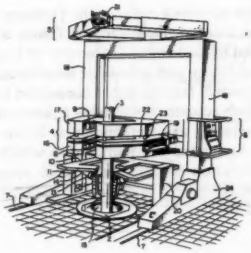
means on said output torque member meshed with and drivingly engaged with said worm gear.

4,545,269

MACHINE TO APPLY A SCREWING OR UNSCREWING TORQUE

Marc Lemaire, Carquefou, and Roland Le Roc'h, St. Sebastien sur Loire, both of France, assignors to Brissonneau et Lotz Marine, France

Filed Apr. 28, 1983, Ser. No. 489,459
Claims priority, application France, Apr. 30, 1982, 82 07541
Int. Cl.⁴ E21B *19/16*
U.S. Cl. 81—57.34 **3 Claims**



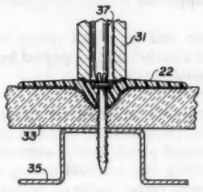
1. A machine to apply screwing and unscrewing torque for drilling shafts and the like with an essentially vertical axis and each provided at opposite ends with threaded portions, an upper threaded portion of each shaft threadedly engaging a lower threaded portion of a successive shaft, said machine having, in combination, a pair of claw means positioned one above the other and provided with jaws having actuating jacks for respectively grasping the upper end of a lower shaft and the lower end of an upper shaft, one of the claw means being fixed to a frame of the machine and the other claw means being mounted for limited angular rotation around the axis of the shafts under the action of at least one jack, each claw means comprising a pair of branches extending oppositely from a base and terminating in spaced relation to define an opening at one side of the claw means opposite to the base, said opening being open at all times, the jaw of each claw means comprising three gripping elements positioned essentially at the vertices of an equilateral triangle, one of said gripping elements being fixed to said base, and the other gripping elements being movably mounted on said branches at opposite sides of said opening and actuated by jacks, each branch having a right-angle configuration interiorly of the associated claw means defined by a pair of substantially perpendicular surfaces, each movable gripping element being mounted on a respective branch for movement in a direction substantially parallel to an associated one of said surfaces of that branch, and guide means being disposed between each movable gripping element and the associated one surface.

4,545,270

DEVICE FOR ASSURING PREDETERMINED JOINT LOADING IN ROOF INSULATION ASSEMBLIES

George G. Dewey, Prospect Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Continuation of Ser. No. 261,321, May 7, 1981, abandoned. This application Apr. 30, 1984, Ser. No. 605,512
Int. Cl.⁴ B25B *23/00*; E04B *1/62*
U.S. Cl. 81—429 **13 Claims**



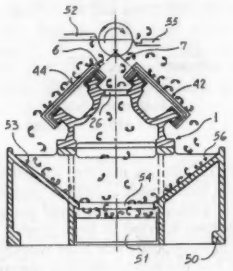
1. In combination with a fastener driving tool with a bit housed within a tubular nosepiece and travel of said bit relative to said nosepiece is limited, and a threaded fastener having an elongated shank with a head at one end driven by said tool, means for causing disengagement of said fastener from said tool comprising a washer having a broad load-distributing flange with a generally flat upper surface a pair of recesses in said upper surface, a first of said pair of recesses being larger than a second of said pair of recesses, said first recess being adapted to matingly locate said tubular nosepiece, said second recess being adapted to house the head of said fastener, a centrally located aperture smaller than said head, an axially extending boss adjacent said aperture, said boss being an integral part of said washer, said boss being shaped to collapse a predetermined axial distance upon exertion of a predetermined tensile load in said fastener, said predetermined axial distance being sufficient to cause disengagement between said fastener and said tool.

4,545,271

TURNING MACHINE

Giordano Romi, Santa Barbara d'Oeste City, Brazil, assignor to Industrias Romi S/A, Santa Barbara d'Oeste City, Brazil

Filed Sep. 27, 1982, Ser. No. 424,978
Claims priority, application Brazil, Sep. 1, 1982, 8108057
Int. Cl.⁴ B23B *17/00*
U.S. Cl. 82—32 **8 Claims**



1. A lathe comprising:

a longitudinal bed having support means disposed thereon including a first pair and a second pair of prismatic guideways oriented with respect to one another in first and second intersecting inclined opposing planes which form an inverted V symmetrical relative to a vertical plane, said guideways of each said pair being spaced apart from and

parallel to each other and arranged longitudinally to said bed, said bed having a plurality of openings disposed between said first and second pair of prismatic guideways for chip flow from the lathe;

a headstock supported by said first pair of prismatic guideways;

a first carriage having a first indexable tool holder and supported by said second pair of prismatic guideways;

a second carriage having a second indexable tool holder and supported by said first pair of prismatic guideways;

a tailstock supported by said first pair of prismatic guideways;

a transmission and automatic speed box containing servooperated clutches and supported by said second pair of prismatic guideways;

a chip conveyor;

means for separately covering said first and said second pair of prismatic guideways so as to form downwardly, outwardly inclined planes having external surfaces; and

a base supporting said bed and having a plurality of internally disposed planar surfaces inclined downwardly, inwardly and symmetrically relative to said vertical plane and forming internal surfaces, a first opening in said base for chip flow, and a second opening in said base for installation of said chip conveyor, said inclined planes of said covering means and said planar surfaces guiding the chip flow to said first opening in said base so that the chips flow first over said external surfaces of said inclined planes of said guideway covering means and then over said internal surfaces of said planar surfaces of said base into said first opening in said base and onto said chip conveyor, said plurality of said openings providing for chip flow through said first opening in said base onto said chip conveyor.

4,545,272

STAMPING OR NIBBLING MACHINE

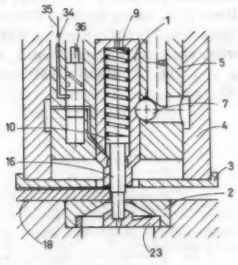
Eugen Herb, Ditzingen, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,604

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136991

Int. Cl.⁴ B26D *5/02*; B23D *27/00*

U.S. Cl. 83—165 **8 Claims**



1. A stamping or nibbling machine for cutting chips from a metal workpiece, comprising a hollow punch adapted to be driven against a workpiece to cut small pieces thereof, a die having a die opening adapted to be located in alignment with the punch and on an opposite side o the workpiece, a centering pin having one end projecting into the interior of said punch and an opposite end extending out of said punch and adapted to engage in the die opening beyond a position of the workpiece, a displacement mechanism carried in said hollow punch and acting on said pin to effect displacement of the pin relative to the punch toward the die, and a centering member carried in said die having a smaller diameter opening than said die opening for receiving an opposite end of said pin to center said hollow punch, said pin having an end portion at its opposite end of reduced diameter from a remaining portion of said pin, adapted to engage in said small diameter opening of said centering member, said end portion having a length so that with said end portion engaged in said small diameter opening, said remaining portion of said pin engages a workpiece on said die and defines a space between the workpiece and said end portion to allow a passage of chips from the workpiece, said end portion of said pin including a centering recess facing said die, and a centering element having a centering projection and disposed in said small diameter opening of said centering member, said centering projection of said centering element cooperating with said centering recess of said pin end portion for centering said punch.

4,545,273

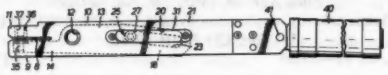
PARTITION WALL BATTERY BOX PUNCHER

Thomas B. Stamp, Laurentides, Haymes Rd., Cleeve Hill, Cheltenham, Gloucestershire, England

Filed Nov. 8, 1983, Ser. No. 549,728

Int. Cl.⁴ B26F *1/02*

U.S. Cl. 83—184 **6 Claims**



1. Apparatus for punching holes in the partition walls of an accumulator case, comprising a support frame, a horizontal support rail carried by said frame, a plurality of hinged punching jaw pairs mounted on and adjustable lengthwise along said guide rail, an individual fluid actuator connected to each individual jaw pair, each actuator comprising a piston and cylinder aligned on an operating axis perpendicular to the respective hinge axis of the associated jaw pair, and in which said rail is adjustable in a direction perpendicular to its length and the hinge axis of each jaw pair is horizontal and perpendicular to the length of said rail.

4,545,274

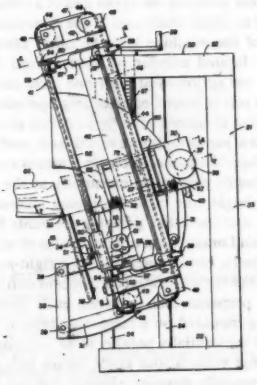
HIP, VALLEY AND JACK RAFTER CUTTING APPARATUS

Henry S. Germond, Lake Oswego, Oreg., assignor to Speed Cut, Inc., Corvallis, Oreg.

Filed Aug. 1, 1984, Ser. No. 636,496

Int. Cl.⁴ B27B *5/20, 5/04*

U.S. Cl. 83—486.1 **20 Claims**



1. A hip, valley and jack rafter cutting apparatus comprising

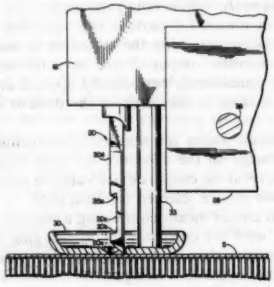
a primary support, a control arm, means mounting the control arm on the primary support for movement along a linear path and for rotation around a pivot axis which is perpendicular to the linear path, a rafter cutting device bodily mounted on the control arm to move therewith and including a linear guideway, a saw carriage including a power driven rotary saw blade mounted on the linear guideway, power means to propel the saw carriage in opposite directions along the linear guideway, additional power means on the rafter cutting device to rotate the linear guideway and saw carriage in opposite directions around a pivot axis parallel to the axis of the linear guideway and perpendicular to the first-named pivot axis, and means to position lumber components in succession fixedly at a cutting station with corresponding longitudinal edges of the lumber components lying in a plane parallel to the first-named pivot axis.

4,545,275

BLADE FOR SEVERING FIBROUS MATERIAL

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Feb. 7, 1983, Ser. No. 464,621
Int. Cl.[4] D06H *7/00*
U.S. Cl. 83—747 **2 Claims**



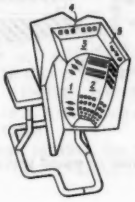
1. Apparatus for severing fibrous sheet material along a line of cut which may be oriented at any desired angle to oriented fibers contained in the sheet material, said apparatus comprising a bed for supporting the sheet material, carriage means movable relative to the bed, an elongated blade supported in said carriage and oriented perpendicularly to the sheet material to be cut, control means for said carriage such that the blade can be moved along an intended line of cut at a linear speed S, means for reciprocating the blade on its own axis in a cyclical fashion between up and down vertically spaced limit positions and at a frequency (f) such that the blade moves through approximately five cycles as it moves a linear distance corresponding to its own width, said blade having a leading edge and a lower edge both of which are sharpened so as to cause cutting suring blade reciprocation, said blade defining a generally rectangular notch with upper and lower edges defing vertically spaced chisel segments, said chisel segments being defined by relieved portions on opposite sides of said blade and said notch being the only notch provided in the leading edge of said blade, said reactangular notch having an inner edge generally parallel to the blade leading edge which inner notch edge is not sharpened, and which inner edge is spaced from the sharpened leading edge by approximately 40–60% of the blade width, said rectangular blade notch having a vertical dimension approximately 50–70% of the blade's vertical reciprocating stroke, and said means for reciprocating said blade between said vertically spaced limit positions presenting said chisel segments to the upper and lower surfaces of said oriented fibrous material at near the maximum linear speed of reciprocation of the blade through the material.

4,545,276

ELECTRONIC ACCORDION HOUSING AND SUPPORT STAND

Giorgio F. Curletto, 6109 Nevada Ave. NW., Washington, D.C. 20015

Filed Mar. 5, 1984, Ser. No. 586,339
Int. Cl.[4] G10H *1/00*
U.S. Cl. 84—1.01 **7 Claims**



1. An electronic accordion support means comprising:
a horizontal tubular base means having a plurality of sides;
first and second vertical posts mounted on said base;
a seat for a performer mounted on said first post, said seat including height adjustment means;
an accordion unit mounted on said second post by a mounting means;
said mounting means comprising a support plate, four stabilizer pins, and one central locking bolt, said mounting means enabling said accordion unit to pivot 360°, to be adjusted in height, and to be adjusted in degree of inclination to fit the needs of a performer.

4. An electronic accordion housing comprising:
a vertical back surface;
a vertically oriented right-hand keyboard which faces away from said back surface;
a vertically oriented left-hand bassboard which faces away from said back surface;
a main control panel adjacent said right-hand vertically oriented keyboard, said panel originating from an inner edge of said right-hand keyboard,
said panel comprising a relatively wide semicircular concave top portion which gradually narrows in a downward direction to a smaller semicylindrical bottom portion, said panel forming a main control surface, at least a portion of which faces in substantially the same direction as said back surface.

4,545,277

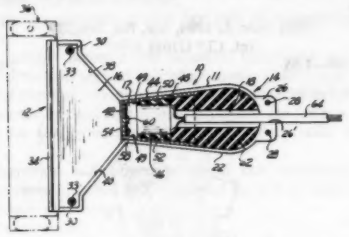
SOUND ATTACHMENT FOR A REED INSTRUMENT

Frank F. Strnad, 1821 Dakota, Flint, Mich. 48506

Continuation-in-part of Ser. No. 476,980, Mar. 21, 1983. This application Apr. 11, 1984, Ser. No. 599,234
The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.
Int. Cl.[4] G10H *3/00*
U.S. Cl. 84—1.04 **35 Claims**

1. A sound attachment for a reed musical instrument such as a harmonica and the like comprising a housing having an open end adapted to be attached to a harmonica and a closed end, an internal converging section in said housing defining a sound funnel between said open end and an intermediate relatively narrow area along said housing, a sound absorbing collar disposed in said housing between said intermediate relatively narrow area and said closed end, said collar having an opening generally centrally thereof, electronic sound pick up means held in said collar opening, said pick up means being located at a predetermined location such that substantially all sound waves emitting from said instrument are received by said pick up means, and a port through a wall of said housing at said converging section defining a sound funnel, wherein said hous-

ing is formed with interior walls diverging between an end of said sound funnel and said pick up means whereby air pressure



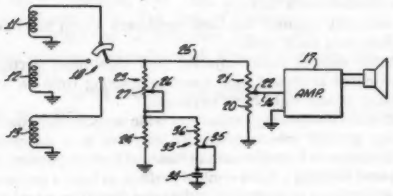
therein is reduced prior to sound waves making contact with said pick up means.

4,545,278

APPARATUS AND METHOD FOR ADJUSTING THE CHARACTERISTIC SOUNDS OF ELECTRIC GUITARS, AND FOR CONTROLLING TONES

Paul R. Gagon, Whittier, and Roger F. Cox, Chino, both of Calif., assignors to Fender Musical Instruments Corporation, Fullerton, Calif.

Filed Apr. 6, 1983, Ser. No. 482,589
Int. Cl.[4] G10H *3/00*
U.S. Cl. 84—1.15 **17 Claims**



1. A method of adjusting the characteristic sound produced by electric guitars, and other musical instruments, having electromagnetic pickups, which method comprises:

(a) providing resistive loading on at least one electromagnetic pickup of a guitar or other musical instrument;

(b) increasing said resistive loading on said pickup for the purpose of adjusting its characteristic sound by reducing substantially the resonance peak produced by the self-resonance of said pickup;

(c) changing the amount of such increasing to achieve the desired amount of such reduction, and thus a desired characteristic sound, and;

(d) maintaining, regardless of said steps (b) or (c), a predetermined maximum amount of resistive loading on said pickup, said maximum amount being such that:

(1) said pickup remains operatively in circuit and effective to result in audible sounds in the loudspeaker of the musical instrument, and;

(2) said resonance peak is, when said maximum of resistive loading is present, substantially eliminated so that the output of the pickup is substantially flat to produce a "jazz" sound, and;

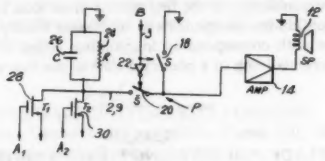
(3) the apparent volume sensed by a listener to the instrument is not substantially lowered.

4,545,279

ELECTRONIC MUSIC NOTE GENERATOR

Tadashi Sano, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,406
Claims priority, application Japan, Aug. 13, 1981, 56-120319[U]
Int. Cl.[4] G10H *1/02*
U.S. Cl. 84—1.26 **2 Claims**



1. In an electronic music note generator outputting audible notes of different pitch or frequency by driving an electro-acoustic output device, the improvement comprising:

a capacitor in a circuit which is adapted to provide for at least partial charging and discharging of the capacitor once for each audible note produced;

first circuit means for periodically applying the instantaneous voltage stored in the capacitor to the input of the electro-acoustic output device as a driving signal, the driving signal being periodically applied at a frequency corresponding to the pitch of the desired musical note; and

second circuit means for selectively controlling the maximum charge on the capacitor for each note so that the sound level at the output device varies in proportion to the maximum charge selected for each note,

the second circuit means comprising a resistor connected in parallel with the capacitor for discharging the capacitor and a resistive element in series with the capacitor through which the capacitor is charged, the resistive element being adapted to be selectively in a condition to conduct charging current to the capacitor or in a non-conductive condition to allow discharge of the capacitor through the parallel resistor, and

the second circuit means selectively controlling the maximum charge on the capacitor by one of allowing different periods of time for charging the capacitor and changing the magnitude of the series resistive element, the series resistive element comprising at least two transistors connected in parallel, the magnitude of the series resistive element and the maximum charge on the capacitor being dependent upon the number of transistors conducting for a fixed time period.

4,545,280

MUSICAL KEYBOARD INSTRUMENT SUPPORT DEVICE

Robert P. Bisey, 2339 Spruce St., Seaford, N.Y. 11783

Filed Jan. 27, 1984, Ser. No. 574,478
Int. Cl.[4] G10C *3/02*
U.S. Cl. 84—177 **13 Claims**

1. A support device for supporting first and second units, each having a front edge and a pair of spaced opposite substantially parallel sides at the opposite ends of said front edge substantially perpendicular to said front edge, said device comprising

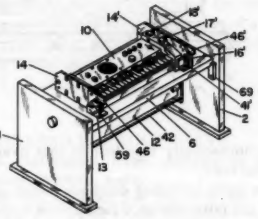
an instrument platform having first and second spaced opposite substantially parallel substantially planar surfaces;

mounting means rotatably supporting said instrument platform for rotation about an axis of rotation;

first joining means for pivotally mounting said first unit on said first surface of said instrument platform for rotation

about an axis spaced from and substantially parallel to said axis of rotation;

a first pair of locking means for locking said first unit in substantially abutting relation to said first surface in locked position and for releasing said first unit to hang freely substantially vertically with said first surface in unlocked position whereby said first unit is in playing position when said instrument platform is substantially horizontal with said first surface up and in stored position, hanging from said first surface, when said instrument platform is substantially horizontal with said first surface down;



second joining means for pivotally mounting said second unit on said second surface of said instrument platform for rotation about an axis spaced from and substantially parallel to said axis of rotation; and

a second pair of locking means for locking said second unit in substantially abutting relation to said second surface in locked position and for releasing said second unit to hang freely substantially vertically with said second surface in unlocked position whereby said second unit is in playing position when said instrument platform is substantially horizontal with said second surface up and in stored position, hanging from said second surface, when said instrument platform is substantially horizontal with said second surface down.

4,545,281

DEVICE FOR STRING INSTRUMENTS FOR ADJUSTING CHORDS

Volker E. Habicht, Nordendstr. 29, D-8080 Emmering, Fed. Rep. of Germany

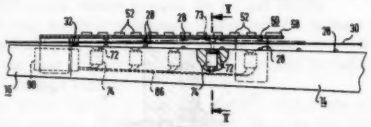
PCT No. PCT/EP83/00091, § 371 Date Dec. 1, 1983, § 102(e) Date Dec. 1, 1983, PCT Pub. No. WO83/03493, PCT Pub. Date Oct. 13, 1983

PCT Filed Mar. 28, 1983, Ser. No. 568,225

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212168; May 25, 1982, 3219590

Int. Cl.⁴ G09B *15/02*; G10D *3/00*

U.S. Cl. 84—315 **10 Claims**



1. An apparatus for effectively shortening the effective vibratory length of the strings of a fretted string instrument such as a guitar, including plate means moveable from a retracted inoperative position into contact with a selected string to press thereagainst to achieve shortening, actuating means for causing movement of said plate means, electronic memory means operably connected to said actuating means for storing musical chord string length information, and a plurality of user operable control switch means electrically connected to said memory means for user selection of desired chords or tones, whereby selection and operation of a desired control switch means will result in generation by said memory means of the signal necessary to achieve the proper string length for the selected chord to operate the proper actuating means and associated plate means.

4,545,282

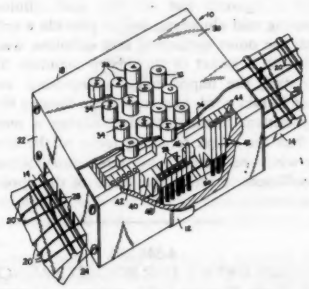
CHORD SELECTOR DEVICE FOR STRINGED MUSICAL INSTRUMENTS

Joseph Arnett, and Jo A. Arnett, both of 2102 Lake Forest Dr., Tallahassee, Fla. 32303

Filed Nov. 14, 1983, Ser. No. 551,114

Int. Cl.⁴ G10D *3/00*

U.S. Cl. 84—317 **1 Claim**

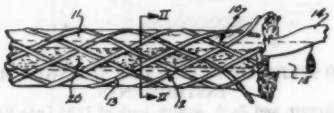


1. A chord former for a string type musical instrument having a neck provided with a plurality of longitudinally extending strings and longitudinally spaced transversely extending frets whereby the effective length of the strings can be varied by selectively pressing spaced strings into engagement with spaced frets comprising a housing having a main body adapted to be releasably secured to the neck of the instrument in such a manner as not to obstruct the strings, a plurality of chord selecting buttons in the upper surface of the housing, an actuating bar connected to each of the chord selecting buttons and extending longitudinally of the neck of the instrument, spaced guide pins at opposite ends of the longitudinally extending actuating bars to keep opposite ends of the actuating bars moving in unison, springs positioned at opposite ends of the actuating bars to lift the opposite ends of the bars when the buttons are released, a plurality of transversely extending selector crossbars, spaced guide pins at opposite ends of the selector bars to keep opposite ends of the transversely extending selector bars moving in unison, springs positioned at opposite ends of the selector bars to lift opposite ends of the selector bars when the chord selecting buttons are released, motion transmitting means including a downwardly extending actuating foot carried by each of the longitudinally extending actuating bars to engage a selected transversely extending selector bar, a downwardly extending string engaging segment carried by each of the transversely extending selector bars to engage a single string with an associated fret, the longitudinally extending actuating bars each having a plurality of downwardly extending actuating feet each of which is adapted to engage an associated transversely extending selector bar to engage a single string with its associated fret whereby actuation of a single chord forming button will engage a plurality of strings at the appropriately spaced frets to produce the chord selection indicated by the actuated button.

4,545,283
UPHOLSTERY WELT CORD

Robert N. Sandberg, Comstock Park, and Robert E. Montle, Wyoming, both of Mich., assignors to Sackner Products, Inc., Grand Rapids, Mich.

Filed Sep. 8, 1983, Ser. No. 530,416
Int. Cl.[4] D04C 1/02, 1/06
U.S. Cl. 87—6 7 Claims

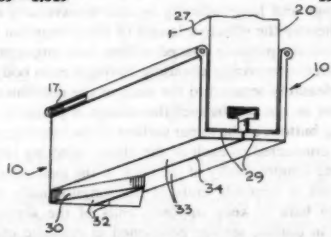


1. In a welting cord comprising compressed crepe sheets of cellulose wadding with at least one continuous sheet of aluminum foil combined therewith and extending the length of said cord for dissipating heat in the event said cord is subjected to heat from a cigarette and the like, said cellulose wadding encompassing said aluminum foil to provide a soft surface to said cord; the outer surface of said cellulose wadding being wrapped with a jacket of threads to maintain the cord-like shape thereof; the improvement comprising: an elongated inner core in said cord, said inner core formed from an elongated cylindrical flexible member having a memory force greater than the shape retaining force of the aluminum foil whereby when the cord is bent, the memory of the composite cord is sufficient to retain the shape of the cord when bent around corners.

4,545,284
PROTECTION DEVICE FOR ROCKET LAUNCHER RAIL

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Apr. 29, 1983, Ser. No. 489,876
Int. Cl.[4] F41F 3/04, 7/00
U.S. Cl. 89—1.819 19 Claims



1. Apparatus for shielding a launch rail member normally exposed to missile exhaust during launching of a missile, said apparatus comprising:

a pivotable device mounted to one end of said member and having a first operative position such that the device is not shielding said member and a second operative position wherein said device shields portions of said member from said exhaust.

4,545,285
MATCHED EXPANSION MUZZLE BRAKE

Clifford E. McLain, 7816 Manor House Dr., Fairfax Station, Va. 22039

Filed Jun. 15, 1982, Ser. No. 388,716
Int. Cl.[4] F41C 21/18
U.S. Cl. 89—14.3 12 Claims

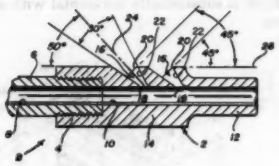
1. A matched expansion muzzle brake aligned with the forward end of a firearm barrel and bore including:

(a) a tube having a uniform diameter through bore equal to and coincident with said barrel bore;

(b) a plurality of outwardly diverging gas ports opening into said through bore;

(c) said gas ports each including narrow throat means adjacent said opening into said through bore;

(d) the combined entrance area of all of said narrow throat means having a cross sectional area substantially equal to the cross-sectional area of said through bore so that the mass flow of the propellant gases flowing through said gas



ports is substantially matched to that available through said barrel bore;

(e) said gas ports including entrance means and exit means and said gas ports entrance means each having their openings in said uniform diameter through bore;

(f) said gas port entrance means and said gas port exit means having their dimensions determined by the following De Laval formula:

$$\frac{\text{GAS PORT AREA exit}}{\text{GAS PORT AREA entrance}} = \frac{A \text{ exit}}{A \text{ entrance}} = \frac{Ae}{At} = \frac{(P_e/P_c)^{1/k}}{\left(\frac{k+1}{2}\right)^{\frac{1}{k-1}}\left(\frac{k+1}{k-1}\left[1-\left(\frac{P_e}{P_c}\right)^{\frac{k-1}{k}}\right]\right)^{\frac{1}{2}}}$$

where expansion to atmosphere $P_e = P_o = 1$ atmosphere for nitro, ballistite, and cordite propellants

$k = C_p/C_v$ = approximately 1.28–1.31

P_c = chamber pressure

C_p = specific heat of the propellant gas at constant pressure

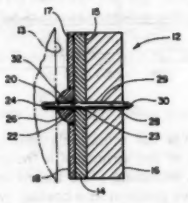
C_v = specific heat of the propellant gas at constant volume; and,

(g) the combined total effective gas contact surface areas of said gas ports being approximately eight to fifteen times the cross-sectional area of said through bore.

4,545,286
ACTIVE ARMOR

Victor Fedij, 1534 Mulloy Dr., Addison, Ill. 60101

Filed Jun. 14, 1984, Ser. No. 620,509
Int. Cl.[4] F41N 5/04, 5/16
U.S. Cl. 89—36.02 15 Claims



1. An apparatus for protecting a surface from a projectile comprising a series of armor plates disposed substantially adjacent one another and substantially covering the surface to be protected; each armor plate mounted to the surface and each armor plate having an individual means for mounting the

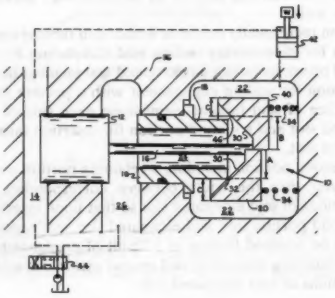
armor plate to the surface, each individual mounting means comprising a spacer having two ends and an opening therethrough connecting each of said ends, one of said ends having a rounded exterior, a bolt having two ends and secured at one end to the plate substantially at the center thereof and having the other bolt end projecting outward from the plate and secured to the surface to be protected, the outwardly projecting bolt end disposed in the opening of said spacer such that the spacer is disposed between the plate and the surface with the rounded exterior end abutting the surface; each said mounting means maintaining the armor plate a predetermined distance from the surface and maintaining the armor plate substantially parallel to the immediate surface underlying the armor plate, said mounting means breakble upon the impact of a projectile onto the armor plate prior to substantial penetration of the projectile into the armor plate.

4,545,287

METERED LOCKOUT VALVE

Alan D. Jackson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Oct. 22, 1982, Ser. No. 436,143
Int. Cl.[4] F15B *11/08, 13/042*
U.S. Cl. 91—420 **3 Claims**



1. A metering lockout check valve in a hydraulic circuit including a pump supplying a double-acting motor through a directional control valve, the lockout valve being placed in the load pressure return circuit between the motor and directional control valve, the lockout valve which is normally closed is opened by a servo piston which senses pressure in the pump pressure side of the circuit, the lockout valve comprising:

a body having a central passage therein;

a movable poppet means positioned in said central passage having a concave conical face thereon;

said servo piston sensing pump discharge pressure and acting on the poppet means to open the poppet means;

a fixed seat member positioned in said central passage engageable by the conical face of the poppet to form an annular line contact seal, said seat member including a fluid passage means;

biasing means lightly urging the poppet means toward a closed position along with load pressure in the return circuit acting on both sides of the poppet means with an effective closing area being defined by the annular line seal;

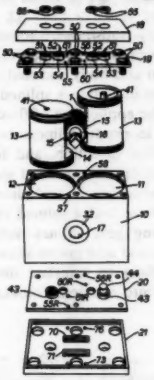
the conical face of the poppet means is concave so that as the poppet opens, the effective closing area increases, thereby requiring higher pressures against the servo piston to further open the poppet whereby in an overrun condition when pressure drops in the pump pressure side of the circuit, the poppet means reduces its opening and provides a metering function.

4,545,288

QUARTER TURN ACTUATORS

Alun Burke, Midhurst, England, assignor to Rodyne Limited, Kent, England

Filed May 25, 1982, Ser. No. 381,793
Int. Cl.[4] F01B *25/26, 31/12*
U.S. Cl. 92—5 R **16 Claims**



1. A quarter turn actuator, comprising:

a body defining two parallel spaced-apart cylinders at least partly coextensive with one another through said body,

a transverse bore in said body which opens into each of said cylinders,

a pair of pistons each formed of plastics material and arranged for reciprocating movement in a different one of said cylinders, each of said pistons having in its external circumferential surface said recess facing toward a transverse bore,

at least one of said pistons being hollow defining a closed axial end face of said piston and an axial bore, the bottom of said axial bore being near said closed axial end face of the piston, said axial bore being open at the opposite end face of the piston,

a rack embedded in a bottom wall of the recess on the external circumferential surface of each piston,

a pinion mounted in said transverse bore in said body and engaging each of the racks embedded in said pistons for rotation in response to movement of said pistons in opposite directions,

means for supplying compressed air to both said cylinders,

biasing means seated in said axial bore of said at least one piston to contact the bottom of said axial bore and extending axially also to contact a part of said body facing said opposite end face of the piston for biasing the piston in a direction which causes said pinion to rotate in a desired direction in the absence of said compressed air, and

an air distribution system interconnecting each end of each cylinder with the other end of the other cylinder for allowing said air supplying means to communicate with the interconnected ends of said cylinders in said body to enable movement of said pistons to rotate said pinion in a selected direction of rotation.

4,545,289

ADJUSTABLE ROTARY ACTUATOR

Paul P. Weyer, 48811 28th Ave., Southeast, Enumclaw, Wash. 98022

Filed Sep. 9, 1983, Ser. No. 530,976
Int. Cl.[4] F01B *31/14*
U.S. Cl. 92—13.6 **10 Claims**

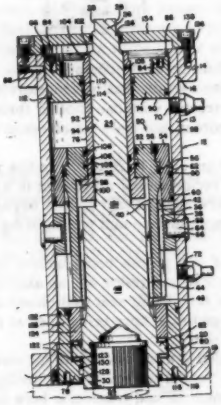
1. A fluid-powered, splined rotary actuator for providing precise, adjustable, end-limited rotational drive to another

device, such as a valve through a rotatable valve stem, comprising:

an outer, elongated, cylindrical body having ports for introducing pressurized fluid therein;

a splined output shaft rotatably supported within said body and having at least one drive end adapted for coupling to said other device to provide rotational drive thereto, said shaft drive end being positioned toward a drive end of said body;

a linear-to-rotary transmission means disposed within said body and operable to provide relative rotational movement between said body and said output shaft, said transmission means including a splined piston sleeve having a piston head for application of fluid pressure to a first side of said head to produce linear movement of said piston sleeve in a first direction, and for application of fluid pressure to an opposite second side of said head to produce linear movement of said piston sleeve in an opposite second direction, and a splined ring gear joined to said body, said ring gear splines meshing with said piston sleeve splines and said piston sleeve splines meshing with said shaft splines to translate linear movement of said piston sleeve into rotational movement of said shaft;



an adjustable, threaded end cap disposed within said body at an end of said body remote from said drive end, said end cap threads cooperating with corresponding threads of said body to permit selective longitudinal positioning of said end cap relative to said body, said end cap having a stop surface for engaging said second side of said piston head as it travels in said first direction and limiting linear travel of said piston sleeve in said first direction to provide an end limit to rotational movement of said shaft in a first rotational direction, said first stop being adjustable from said remote end; and

an adjustable, elongated stop sleeve positioned about said shaft for rotational movement therewith, said stop sleeve extending from a position outward of said end cap at said remote body end to a position beyond said piston head, and having a stop shoulder for engaging said first side of said piston head as it travels in said second direction and limiting linear travel of said piston sleeve in said second direction to provide an end limit to rotational movement of said shaft in a second rotational direction, said stop sleeve being threaded for cooperation with corresponding threads of said shaft to permit selective longitudinal positioning of said stop shoulder relative to said shaft, said stop shoulder being adjustably positioned by rotation of said stop sleeve from said remote end.

4,545,290

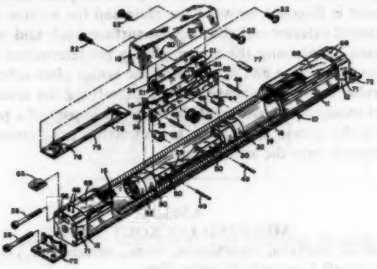
PRESSURE CYLINDER

Walter G. Lieberman, Minneapolis, Minn., assignor to Tol-O-Matic, Inc., Minneapolis, Minn.

Filed Dec. 23, 1983, Ser. No. 564,990

Int. Cl.[4] F01B *29/00, 9/00*

U.S. Cl. 92—88 **45 Claims**



1. A pressure cylinder comprising:

an elongated tubular member having a side wall, a pair of pressure chambers and an elongated slot extending through said side wall and defined by opposed edge portions of said side wall;

a piston reciprocally movable within said tubular member; and

means for successively sealing said slot during movement of said piston including an elongated seal member having a first portion for sealing engagement with a portion of the inner surface of said tubular member on each side of said elongated slot and a second portion for insertion into said elongated slot,

said second portion including a retaining portion with a width greater than the width between corresponding side wall portions of said elongated slot so that upon insertion of said second portion into said elongated slot, said second portion will be retained therein as a result of engagement between the retaining portion of said second piston and said side wall portions of said elongated slot.

4,545,291

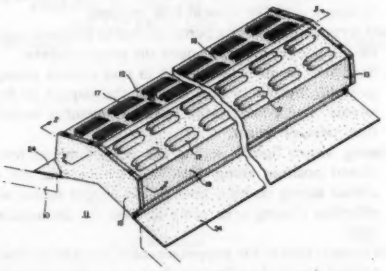
ROOFLINE VENTILATORS

Harold G. Kutsch, and Earl A. Ehrlich, both of Dubuque, Iowa, assignors to Klauer Manufacturing Company, Dubuque, Iowa

Filed Mar. 8, 1984, Ser. No. 587,503

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—42.21 **7 Claims**



1. A ridge ventilator for farm barns comprising, an elongated flue and baffle structure adapted to be mounted over an elongated opening formed in the roof of the building at the ridge thereof, said flue and baffle structure in cross section comprising a flue portion having inwardly sloping side walls, a baffle

portion in the form of an isosceles triangle in cross-section and having an elongated central opening in its base the edges of which are joined to the side walls of the flue portion, an outer storm band casing surrounding said flue and baffle structure and having a top which slopes gently laterally from its longitudinal center line, end closure caps mounted at each end of the ventilator, said caps, flue and baffle structure and outer casing being secured together to form an intregal ventilator unit, louvres formed in the base of the baffle portion and in the side walls of the flue portion, the top of the outer casing having louvres formed therein the openings therein facing the longitudinal center line.

4,545,292

ROOF RIDGE VENTILATION APPARATUS

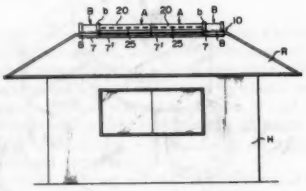
Michio Inokawa, Ichikawa; Minoru Watanabe, Yamato; Yoshiteru Miyasaka, and Toshio Watanabe, both of Nihonbashi, all of Japan, assignors to Tokyo Land Corporation; Nippon Light Metal Co., Ltd. and Shin Nikkei Company, Ltd., all of Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,495

Claims priority, application Japan, Apr. 22, 1982, 57-59340[U]

Int. Cl.[4] F24F *7/02*

U.S. Cl. 98—42.21 **17 Claims**



1. A ridge ventilation apparatus for use between spaced apart ridge tiles that are positioned over the ridge of a roof which has an upwardly directed air duct at its ridge for exhausting air from therebelow, said ridge tiles having identical exterior configurations, said ridge ventilation apparatus comprising

an elongated top frame which has an upper surface and a lower surface, said upper surface being configured to substantially conform to the exterior configuration of said ridge tiles, said elongated top frame including a left half section and a right half section, each of said half sections including an upper end and an opposite lower end, the upper ends of said half sections being interconnected, each of said half sections including an exhaust port therein between its upper end and its lower end and a baffle plate which extends downwardly from its lower surface at a point between its upper end and its exhaust port, the lower end of said baffle plate extending downwardly to a point below the associated exhaust port, and

elongated left and right lower frames which are respectively connected to the inner surfaces of said left and right half sections such that a spacing is left between said lower frames, each of said lower frames including an upper part which includes an exhaust opening therein, said exhaust opening being located above said lower end of the baffle extending downwardly from the associated half section of said top frame, and a lower part which includes a connecting portion which extends outwardly to contact the lower end of the associated half section of said top frame, said connecting portion including a drainage opening therein, said left and right lower frames and said left and right half sections forming therebetween respective left and right chambers, air from said air duct at the ridge of said roof being able to pass outwardly through said exhaust openings in the upper parts of said left and right lower frames and into said left and right chambers, around the baffle plates extending downwardly from the associated left and right half sections and out said exhaust ports, said baffle plates preventing water from passing inwardly through said exhaust openings.

4,545,293

MULTIPLE-CASING CHIMNEY

Werner Münz, Neufahrn, Fed. Rep. of Germany, assignor to Schiedel GmbH & Co., Munich, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,775

Claims priority, application Austria, Mar. 30, 1981, 1485/81

Int. Cl.[4] E04F *17/02*

U.S. Cl. 98—58 **18 Claims**

1. Multiple-casing chimney with at least one smoke-carrying inner tube, a heat insulating layer surrounding the inner tube, and a jacket supporting the outside of the heat insulating layer, characterized in that canal means defining flow paths, distributed over the circumference of the chimney, are provided within the jacket for a venting gas supplied from and discharged to the outside, the flow paths including means for communicating with the heat insulating layer, the shape of the inner circumference of the jacket differing from that of the other circumference of the jacket so as to define sections of the jacket, spaced about the circumference of the jacket, that have an increased wall thickness, the flow paths being provided at least in part in the thicker sections of the jacket.

4,545,294

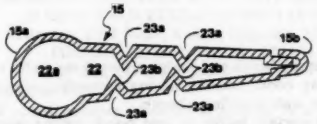
FRICTIONAL BLADE ASSEMBLY FOR GRILLE

Lloyd G. Dayus, 1735 Mattawa Ave., Mississauga, Ontario, Canada L4X 1K5

Filed Nov. 21, 1983, Ser. No. 554,078

Int. Cl.[4] F24F *13/08*

U.S. Cl. 98—110 **25 Claims**



1. A frictional blade assembly for grilles to be used in association with air ventilation systems wherein said assembly comprises:

a first thermoplastic support bar defining a stem, which stem defines a longitudinal axis, and having a plurality of coplanar abutments extending essentially normal to one side of said axis, each of said abutments being more or less the same length and having an outer surface of uniform generally cylindrical shape and having more or less the same

diameter, and said abutments being formed integrally as part of said support bar;

a plurality of blades, each of said blades defining a first and second ends and upper and lower sides, and being of uniform cross-sectional shape and size along its length, each said blade defining a generally streamline-shaped tube, said tube defining a first edge, a second edge and an internal space, the tube being formed from an integral sheet of relatively thin material whereby the sheet is bent back upon itself and one sheet edge is secured below another, said internal space at said first edge being of generally circular cross-section over an arc of approximately 270°, said circular cross-section having a diameter of between 0.002" and 0.004" less than that of said abutments, said first end of said blades being rotatably attached to respective said abutments by inserting a said abutment into said internal space at the first edge of said blade, whereby a frictional fit between each said abutment and a respective said blade is obtained;

pairs of longitudinal rib means formed along the length of each side of each blade, members of each pair being essentially in opposition to each other and members of at least one pair defining a space therebetween, and,

and second thermoplastic support bar defining a stem, which stem defines a longitudinal axis, and having a plurality of coplanar abutments extending essentially normal to one side of said axis, said second bar being affixed to said second ends of said blades at said first edges, whereby said blades may be rotated relative to said first and second bars against a frictional resistance.

4,545,295

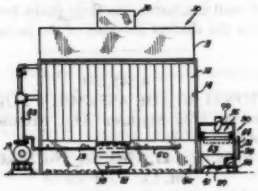
SLUDGE REMOVAL APPARATUS

Frederick E. Russell, Elgin, Ill., assignor to Protectaire Systems Co., Elgin, Ill.

Division of Ser. No. 260,888, May 6, 1981, Pat. No. 4,432,870. This application Dec. 15, 1983, Ser. No. 561,737

Int. Cl.⁴ B05C *15/00*

U.S. Cl. 98—115.2 **4 Claims**



1. A spray booth and sludge removal apparatus comprising:

a spray booth housing having upstanding sidewalls and a rear wall to define a booth,

water curtain baffles in said booth having water flowing down the baffles to trap air borne overspray particles carried by the air flowing through the baffles,

a water holding tank located within the booth sidewalls and below the water curtain baffles to receive the water and trapped overspray particles,

an auxililary tank separated from the holding tank for receiving water and floating sludge from the holding tank, a reciprocating skimmer means at the auxiliary tank for skimming floating sludge from the top surface of the water in the auxiliary tank and for pushing the floating sludge from the top surface of the auxiliary tank across a discharge end of the auxiliary tank,

aeration means for aerating the water to oxygenate the water being recirculated through said water curtain baffles, said holding tank and said auxiliary tank,

water and sludge inlet means for receiving water and surface sludge from the holding tank and for discharging the same into the auxiliary tank, and

water circulating jet nozzles in said holding tank for generating surface currents to transport floating sludge on the water in the holding tank to said inlet means for the auxiliary tank.

4,545,296

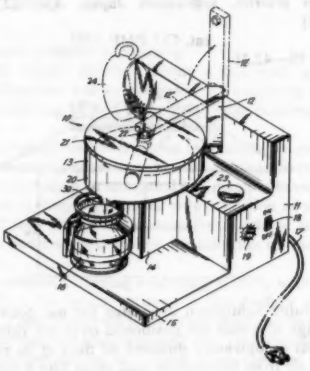
CENTRIFUGAL APPARATUS FOR MAKING COFFEE

Sonja Ben-Shmuel, 1031 Ardsley Rd., Schenectady, N.Y. 12308

Filed Jun. 19, 1984, Ser. No. 622,116

Int. Cl.⁴ A47J *31/22*

U.S. Cl. 99—289 P **7 Claims**



1. A coffee-making apparatus, comprising

a housing bounding a catch chamber;

a rotary body mounted with clearance in said catch chamber for rotation in air about an axis, bounding a centrally located recess and at least one enclosed internal space extending outwardly from said recess, and including substantially radially extending partitioning wall means subdividing said internal space into at least two compartments each of which has an inner and an outer end portion as considered in the radial direction, the inner end portion of at least one of which opens into said recess, and which are in communication with one another at said outer end portions thereof, and outlet port means arranged at the inner end portion of the other of said compartments and establishing communication between the latter and said catch chamber;

means for introducing ground coffee into said one compartment;

means for rotating said body in air about said axis to subject the contents of said rotary body to the influence of centrifugal forces;

means for delivering hot liquid into said recess at least during the operation of said rotating means for the liquid to flow under the influence of said centrifugal forces into and through said one compartment and the quantity of coffee present in the latter with attendant formation of a coffee beverage, and for the coffee beverage to gradually fill said other compartment from the outer end portion to said outlet port means, also under the influence of said centrifugal forces, and to be discharged through said outlet port means only after reaching the same;

a receptacle for the coffee beverage discharged from said outlet port means; and

means for continuously discharging said coffee beverage from said catch chamber to prevent accumulation of such beverage in said catch chamber.

4,545,297

ONION PEELING DEVICE

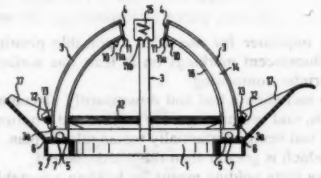
Rolf Ihlow, Dresdner Str. 24a, D-3201 Holle, Fed. Rep. of Germany

Filed Jul. 26, 1984, Ser. No. 634,632

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334659

Int. Cl.⁴ A23N *7/00*

U.S. Cl. 99—586 **22 Claims**



1. In an onion peeling apparatus having a holder for an onion having a cross-section, with pivot arms supported centrally on a support plate provided with a clearance, where said pivot arms are pulled toward each other by elastic means and comprise heads pointing toward the center of said clearance, stop means determining spacing between said heads and said heads provided with slitting knives located in a pivot plane, the improvement comprising:

said clearance being circular, at least three of said pivot arms (3) mounted around said circular clearance (1) whereby said heads are guided over said onion, said heads provided with strippers (11) extending tangentially to said cross-section of said onion and mounted on free ends of said heads beyond said slitting knives.

4,545,298

CYLINDRICAL BALER HYDRAULIC CIRCUIT FOR CONTROLLING BALE CHAMBER TENSION AND OPERATING BALE DISCHARGE GATE

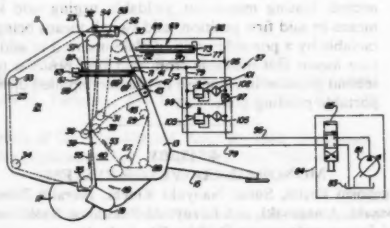
Jean Viaud, Chargey-les-Gray, France, assignor to Deere & Company, Moline, Ill.

Filed Jun. 8, 1984, Ser. No. 618,620

Claims priority, application European Pat. Off., Jul. 4, 1983, EP83401369.0

Int. Cl.⁴ B30B *5/06*

U.S. Cl. 100—88 **11 Claims**



1. In a cylindrical baler comprising:

a front section;

a rear bale discharge gate connected to said front section;

a plurality of guide and tensioning rollers rotatably mounted in the front section and rear gate;

a plurality of belts supported on and extending around said rollers, said belts and rollers defining an expandable chamber for forming cylindrical bales, said gate movable between an open position for bale discharge and a closed position for bale formation;

a movably mounted, belt tension arm; and

at least one roller supported on and movable with said arm for tensioning said belts; and

a hydraulic circuit means for resisting movement of said arm during bale formation and for opening and closing said gate following bale formation; the improvement wherein:

said circuit means includes a hydraulic jack connected between said belt tension arm and said gate.

4,545,299

HAND-OPERATED PRESS FOR TREATING VEGETABLES OR FRUIT

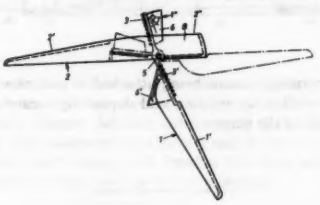
Reinhard Ahner, Wolfganggasse 25, A-1120 Vienna, Austria

Filed Aug. 30, 1984, Ser. No. 645,705

Claims priority, application Austria, Aug. 31, 1983, 3119/83; Jul. 24, 1984, 2393/84

Int. Cl.⁴ B30B *9/00*

U.S. Cl. 100—112 **18 Claims**



1. A hand-operated press for treating vegetables or fruit, comprising two levers, which are pivotally connected and in at least part of their length serve as arms, wherein one of said levers is provided with a pressing chamber, which serves to receive the material to be treated and is defined at least in part by a bottom wall formed with through openings, and the other of said levers is provided with a pressing member, which during a pivotal movement of the levers is adapted to enter the pressing chamber, and wherein at least two pressing chambers are provided and are defined at least in part by bottom walls formed with through openings having different cross-sections to obtain juice or different size pieces of the vegetables or fruit, and wherein at least two pressing members are provided for entering respective ones of the pressing chambers.

4,545,300

SCREEN PRINTING APPARATUS AND PROCESS COMPRISING CHAMBER WITH MOVABLE UPPER SURFACE-SQUEEGEE COMBINATION

Roger A. Jensen, 1922 Main, Kansas City, Mo. 64108

Filed Jul. 11, 1984, Ser. No. 629,571

Int. Cl.⁴ B41L *13/00, 13/18*

U.S. Cl. 101—123 **27 Claims**

1. A screen printing assembly attachable to a screen frame supporting a screen having a pattern comprising:

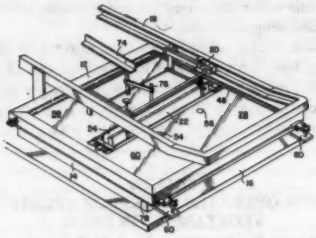
a support frame positionable adjacent and attachable to the screen frame,

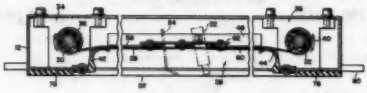
a depositing means connected to said support frame for depositing and forcing an ink coating on and through the screen and onto a substrate disposed adjacent the screen, and

a chamber means connected to said support frame and adjacent the screen for defining a sealed chamber in which said depositing means deposits the coating onto the screen,

said chamber means having an upper surface movable relative to said support frame and to the screen,

said chamber means including a sealing means for sealing said surface to said support frame as said surface moves relative to said support frame, and





said depositing means being attached to and movable with said surface for moving said depositing means along the length of the screen.

4,545,301

INK APPLICATOR FOR A TAMPON PRINTING MACHINE

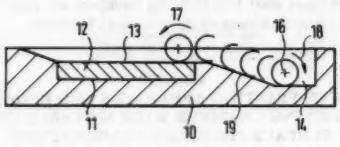
Holger Reinhold, Freudenstadt, Fed. Rep. of Germany, assignor to TAMPOflex GmbH, Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,459

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1983, 8331501[U]

Int. Cl.⁴ B41F *17/00, 31/00*

U.S. Cl. 101—163 **8 Claims**



1. An ink applicator for a tampon printing machine comprising a printing block holder (10) in which an ink holding pan (14) is adjacent to the printing block (12), connected by an inclined surface (19) which makes an uninterrupted transition to the top (13) of printing block (12) and over which an ink distributor (15) positioned freely movable between said ink holding pan and said printing block, can be reciprocated, characterized by said ink distributor being an ink roller (16) rotatably mounted, said roller (16) rotatably movable in said direction of movement of said ink distributor by contact with said inclined surface (19) and said top (13) of said printing block (12), and the diameter of said roller (16) being smaller than the depth of said ink holding pan (14).

4,545,302

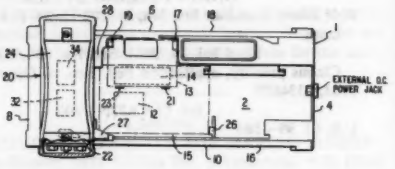
VALIDATOR/IMPRINTER APPARATUS

Dana DeLorenzo, Brockton, Mass., assignor to DBS, Inc., Randolph, Mass.

Filed Dec. 28, 1984, Ser. No. 687,254

Int. Cl.⁴ B41F *3/18*

U.S. Cl. 101—269 **12 Claims**



1. An imprinter for use with a portable printing surface having fluorescent markings on at least one surface thereof, said imprinter comprising:

a base including a bed and downwardly extending support walls, said bed having a top surface and a bottom surface, said bed being substantially rectangular in plan, the length of which is greater than the width thereof;

printing plate holding means for holding a portable printing plate in place on said top surface of said bed;

document holding means for holding a document in place on said top surface of said bed, said document holding means holding said document in at least partially overlapping relationship with said portable printing plate;

carriage means, containing at least one print roller, guidingly and movably mounted on said base for motion in the length wise direction of the bed to effect relative movement of said print roller and said bed and thereby imprint data from said portable printing plate to said document;

aperture means, through said bed, for communicating said top surface of said bed with said bottom surface of said bed, said aperture means receivable of said portable printing plate therein;

guide means for holding said portable printing plate in a predetermined orientation in said aperture means; and

card validation means comprising:

lamp means for irradiating a portable printing plate held in said guide means with radiation of a wavelength which will cause fluorescence of said fluorescent markings on said portable printing plate;

battery means for supplying electrical power to said lamp means;

switch means for connecting said battery means to said lamp means, said switch means movable from a first position wherein said lamp means and said battery means are electrically disconnected to a second position wherein said lamp means and said battery means are electrically connected, biasing means for yieldably urging said switch means to said first position, said switch means being contactable by a portable printing plate inserted in said aperture means and movable from said first position to said second position in response to pressure applied upon said portable printing plate.

4,545,303

MONORAIL CONVEYOR SYSTEM

Shigeyoshi Fujita, Suita; Naoyuki Kiuchi, Ibaraki; Tomoyuki Sasaki, Amagasaki, and Kazuyoshi Fukuhara, Kashiwara, all of Japan, assignors to Daifuku Co., Ltd., Japan

Filed Jun. 26, 1984, Ser. No. 624,577

Int. Cl.⁴ E01B *25/22*

U.S. Cl. 104—93 **5 Claims**

1. A monorail conveyor system comprising:

A. a rail (1) having

1. a hollow top part (6),

2. a hollow bottom part (**11**) and
3. a hollow vertical wall portion (**122**) having spaced right and left vertical side walls (**122***a* and **122***b*) connecting said top part (**6**) and said bottom part (**11**);

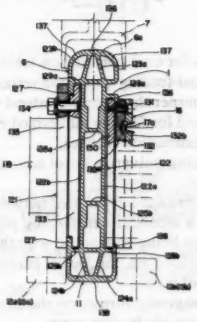
B. said hollow top part (**6**) having
1. an upper wall (**6***a*),
2. a lower wall,
3. spaced side walls connecting said upper wall and said lower wall and
4. a pair of inner partition walls (**123***a* and **123***b*) extending from the transverse center of said upper wall (**6***a*) to said lower wall;

C. at least two lateral inner partition walls (**125***a* and **125***b*) connecting said left and right vertical side walls (**122***a* and **122***b*) at intermediate positions along the length thereof;

D. a drive wheel (**7**) rotatable on said rail (**1**);

E. a rotary shaft (**5**) extending horizontally and transversely and rigidly connected to said drive wheel (**7**);

F. a gear case (**4**) supporting said rotary shaft (**5**);



G. a cart frame (**3**) including said gear case (**4**);

H. a driving motor (**9**) having an output shaft (**8**) extending in a forward-rearward direction substantially parallel to said rail;

I. an intermediate shaft (**20**) mounted in said gear case (**4**) substantially parallel with said rotary shaft (**5**);

J. a hypoid gear (**22**) mounted on said output shaft (**8**) of said driving motor (**9**);

K. a hypoid wheel (**23**) mounted on said intermediate shaft (**20**) in said gear case (**4**) and meshing with said hypoid gear (**22**) on said output shaft (**8**); and

L. a reduction gear mechanism housed in said gear case (**4**), said reduction gear mechanism having
1. a small gear (**21**) mounted on said intermediate shaft (**20**) and
2. a larger gear (**19**) mounted on said rotary shaft (**5**), whereby said driving motor (**9**) drives said rotary shaft (**5**) to rotate said drive wheel (**7**).

4,545,304

ARTICULATED RAILROAD CAR

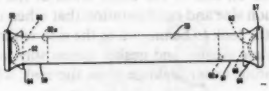
Rene H. Brodeur, 2108 Beechwood Ave., Wilmette, Ill. 60091, and Boris S. Terlecky, 234 Lippincott La., Fox Lake, Ill. 60020

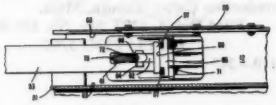
Continuation of Ser. No. 409,844, Aug. 20, 1982, abandoned. This application Apr. 4, 1985, Ser. No. 719,048

Int. Cl.[4] **B61D** *17/00*; **B61G** *9/20*

U.S. Cl. 105—3 **14 Claims**

1. An articulated railroad car for transporting wheeled vehicular trailers comprising at least two platforms having forward and rearward ends, a wheeled truck at the forward and rearward end of each platform, said trucks each including only two wheels joined by a single axle and a frame supporting said platform, disengageable couplings at the forward end of the first one of said platform and at the rearward end of the last of said platforms, respectively, and a semi-permanent coupling connecting the rearward end of said first platform to the forward end of the adjoining platform, said coupling including a rigid drawbar engageable with means at the rearward end of said one platform and at the forward end of said adjacent platform to transmit pushing and pulling forces therebetween,





said drawbar allowing relative movement between said platform in both horizontal and vertical directions, said drawbar having enlarged flanges defining substantially flat faces at opposite ends, said platforms each having means fixed thereto having flat faces confronting said drawbar flat faces and engageable therewith when said car is being pushed.

4,545,305

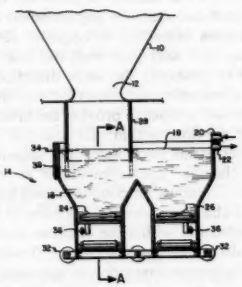
COMBINED PRIMARY AND SPARE SUBMERGED SCRAPER CONVEYOR ARRANGEMENT

Guy D. Howard, Vernon, and Alexander Bosso, Broad Brook, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 5, 1984, Ser. No. 657,912

Int. Cl.[4] **F23J** *1/00*

U.S. Cl. 110—165 R **2 Claims**



1. In combination a top-supported furnace in which coal or other ash-bearing fuel is burned, opening means in the furnace bottom, a bottom supported tank formed of outer walls open at its upper end and containing water positioned beneath the furnace opening means, into which the ash from the furnace falls, a pair of side-by-side scraper conveyors positioned within the tank for removing the ash from the tank, the tank being mounted on movable means so as to permit one or the other of the conveyors to be positioned directly under the furnace

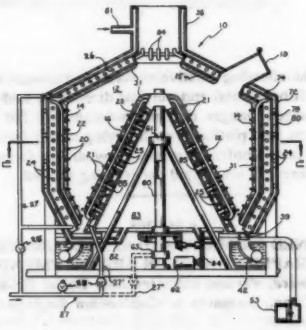
bottom opening means, plate means secured to the furnace bottom extending down into the water in the tank, which plate means completely surround the furnace bottom opening means, a divider wall in the tank between the two conveyors, said divider wall extending to a height above the conveyors but below the bottom edge of the plate means, so that the tank can be moved so as to position either one of the conveyors directly beneath the furnace bottom opening means without removing the plate means from the water in the tank, and a hinged door on one of the outer walls of the tank, said door being of such size and configuration that when the door is open it permits the tank to be moved to the side without interference with the plate means, and gasket means surrounding the door for preventing water leakage from the tank when the door is closed.

4,545,306

HIGH TEMPERATURE FURNACE

Norman E. Wolfram, Turners Falls, Mass., assignor to Northeast Pyreduction Corp., Woburn, Mass.

Filed Oct. 6, 1983, Ser. No. 539,683
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—247 **4 Claims**



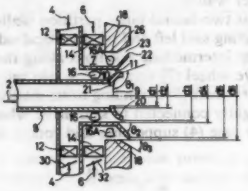
1. A furance for burning fuel and/or organic waste material having a combustion chamber defined by an upwardly extending, conical base member and an outer wall surrounding said base and having a flue therethrough for exhausting combustion gases from said chamber, the improvement comprising a plurality of nozzles extending in opposite directions into said chamber from both said outer wall and base member and then tangentially in generally the same direction relative to said wall and base member, and means for supplying high velocity, heated air to said nozzles to provide unidirectional high velocity, circular air flow within said chamber so that waste or unburned fuel within said chamber is suspended and retained within the chamber until combustion is completed, the air supply means including air conduit embedded within the walls defining said chamber, whereby a portion of the energy generated by combustion within the chamber and absorbed by the chamber walls is transferred to the air flowing in said conduit to increase its temperature prior to its burning injected by said nozzles into the chamber and resulting in increased air volume at high velocity and valve means controlling the air flow within said conduit for maintaining the chamber walls within a predetermined temperature range, said furnace having an outer jacket wall construction adapted for the flow of air therein, an interior chamber disposed within said conical base and means for conducting air from the jacket to said interior chamber whereby air heated in the furnace jacket is supplied to said interior chamber, said conical base including a plurality of air passages therethrough whereby the jacket-heated air is supplied to the central portion of said combustion chamber.

4,545,307

APPARATUS FOR COAL COMBUSTION

Shigeki Morita; Tadahisa Masai; Shigeto Nakashita; Toshio Uemura; Fumio Kouda, and Tsuyoshi Nawata, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 617,188
Claims priority, application Japan, Apr. 23, 1984, 59-81646
Int. Cl.[4] F23D *1/02*
U.S. Cl. 110—264 **17 Claims**



1. An apparatus for coal combustion which comprises:
- a pulverized coal-feeding pipe (pulverized coal pipe) inserted into a burner throat on the lateral wall of a combustion furnace and for feeding pulverized coal together with air into the combustion furnace;
- a means for feeding pulverized coal and air into the pulverized coal pipe;
- a secondary air passageway formed between the pulverized coal pipe and a secondary air-feeding pipe said secondary air-feeding pipe being concentric with the pulverized coal pipe and provided on the outer peripheral side of the pulverized coal pipe;
- a ternary air passageway formed on the outer peripheral side of the secondary air-feeding pipe;
- a means for feeding air or an oxygen-containing gas into said secondary air passageway and that into said ternary air passageway; and
- a bluff body provided at the burner end of said pulverized coal pipe and encircling and extending said pipe, said bluff body having essentially the shape of an L-letter, with a first portion of the L perpendicular to and attached to said pulverized coal pipe and a second portion parallel to said pulverized coal pipe and attached to and extending said first portion by forming an angle in the range of 90°–150° with said first portion, wherein the inner diameter of said pulverized coal pipe is less than the inner diameter formed by said second portion of said bluff body.

4,545,308

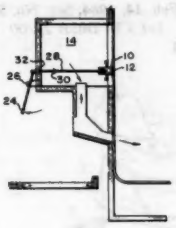
APPARATUS FOR REGULATING AIRFLOW TO A CHEMICAL RECOVERY BOILER

Theodore R. Zaterka, South Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 30, 1984, Ser. No. 645,633
Int. Cl.[4] F23L *1/12*
U.S. Cl. 110—297 **3 Claims**

1. In combination, walls forming a furnace, a nozzle, air passage means connected to the furnace through the nozzle, said nozzle having an open outer end, and an open inner and slot means formed in the sidewall thereof, a plug positioned within the nozzle, actuating means connected to the plug for moving it toward and away from the furnace, the plug being of such size that it prevents air flow into the outer end of the nozzle, and when the plug is moved to a first position closely adjacent to the furnace it stops air flow through the slot means to the furnace, and when the plug is moved to a second posi-

tion more removed from the furnace, it allows air flow to the furnace through the slot means, and stop means on the actuating means for preventing the plug from being completely removed from the nozzle.

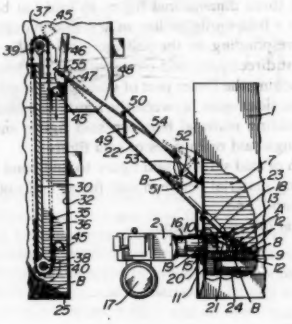


4,545,309

FURNACE FOR BURNING FLAMMABLE PARTICLES

Raoul Comtois, 19730 Côte Nord, Sainte-Thérèse, Canada J7E 4H5)

Filed Apr. 2, 1984, Ser. No. 595,654
Int. Cl.[4] F23H *3/00*
U.S. Cl. 110—300 **9 Claims**



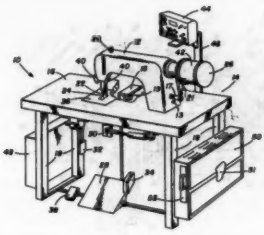
1. In a furnace for burning flammable solid particles and including a combustion chamber having a vertical chamber wall and a bottom chamber wall delimiting part of said chamber, an air box, of L-shape, fixed to said chamber wall, having a hollow vertical leg with a lower end and contiguous to said chamber wall and a hollow horizontal leg communicating with the lower end of said vertical leg, longer than the latter and extending inwardly within said combustion chamber, spaced above and covering only a portion of said bottom chamber wall, said vertical and horizontal legs having an inner vertical and an upper horizontal main wall, respectively, each exposed within said chamber and each having a plurality of holes distributed thereover, said box having an inlet, means for feeding said box through said inlet with pressurized air to create air flow through said holes upwardly and also towards the interior of said combustion chamber, and means for discharging flammable solid particles into said combustion chamber over said horizontal leg and inwardly of said inner vertical wall of said vertical leg.

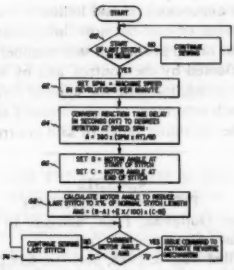
4,545,310

METHOD AND APPARATUS FOR ACCURATELY CONTROLLING THE SEAM MARGINS PRODUCED BY A SEMI-AUTOMATIC SEWING MACHINE

Stephen S. Treadwell, Richardson, and Donald D. Isett, Dallas, both of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Filed Dec. 29, 1983, Ser. No. 566,655
Int. Cl.[4] D05B *19/00*
U.S. Cl. 112—121.11 **13 Claims**





1. In a sewing machine having a material feed and a reciprocable needle for stitching seams in material, a drive motor and a stitch length variance mechanism having a finite activation time delay, seam length control apparatus comprising:

means for detecting a material discontinuity in advance of the end of a seam;

means for controlling the reciprocable needle to sew a predetermined number of stitches after said detecting means detects said material discontinuity; and

means responsive to said detecting means for operating the stitch length variance mechanism at an angle of drive motor rotation which compensates for the activation time delay associated with the stitch length variance mechanism and the material feed characteristics to vary the amount of completion of the last stitch of said predetermined number of stitches and thus precisely control the length of the seam.

4,545,311

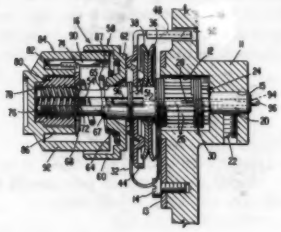
THREAD TENSIONING DEVICE FOR A SEWING MACHINE

Anthony Giaimo, Staten Island, N.Y.; Robert H. Larsen, Middletown, and Donald Rodda, Butler, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Aug. 2, 1984, Ser. No. 637,193
Int. Cl.[4] D05B *47/02*
U.S. Cl. 112—254 **1 Claim**

1. A thread tensioning device for a sewing machine including an arbor, a pair of thread tensioning discs slidably mounted on the arbor, an arbor affixed stop on one side of the discs, a slidably mounted member on the arbor located on the opposite

side of the discs from the stop, a raised conically tapered portion formed on said member, a helically coiled spring which encircles the raised portion of said member and acts at one end against said member to cause the discs to be squeezed against any thread extending therebetween and so resist movement of the thread through the thread tensioning device, and an operator's control movable through a defined range for adjusting deflection and thereby the compression of coils of the spring to alter the resistance to movement of the thread through said



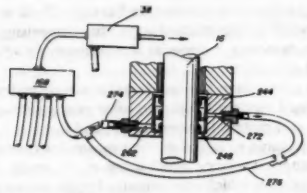
device, the improvement which comprises so dimensioning said raised conically tapered portion of said member relatively to the internal dimensions of said helically coiled spring as to cause engagement of one or more intermediate coils of the spring with said raised portion of said member after the spring is partially deflected by the control, and by so impeding free flexure of the spring, increase the applied force obtainable at the discs by each increment of movement of said control over a portion of the operating range of said control.

4,545,312

TUFTING MACHINES

Gary L. Ingram, Ooltewah, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Aug. 6, 1984, Ser. No. 638,243
Int. Cl.[4] D05B *71/00*
U.S. Cl. 112—256 **37 Claims**



1. In a tufting machine having a head, a plurality of push rods journally mounted in respective push rod housings depending downwardly from the head, drive means in the head reciprocably driving said push rods, and lubrication means including a lubricant supply for lubricating said drive means and said push rods, each of said push rod housings having a sleeve including an aperture extending therethrough for receiving a respective push rod, said sleeve including an annular recess, an annular seal disposed about said push rod within said recess, means defining a circumferential groove disposed in said sleeve above said seal opening onto said aperture and said push rod, first and second passageways communicating with said groove and extending through said sleeve for communicating said groove with the exterior of said sleeve, means communicating at least said first passageway with said lubrication means, and means for creating a pressure differential between said lubrication supply and said groove for returning lubricant accumulating in said groove to said lubricant supply.

4,545,313

METHOD FOR MAKING A HAT

Hsing-Hui Chiang, Taipei, Taiwan, assignor to Asian Star, U.S.A., Inc., Galveston, Tex.

Filed Feb. 14, 1984, Ser. No. 579,948
Int. Cl.[4] D05B *23/00*
U.S. Cl. 112—263.1 **2 Claims**

1. A method for making a hat comprising the following steps:

Fabricating a band for encircling the head with an adjustable means for fitting a range of head sizes;.

Attaching to said band a hat back of sturdy material which extends upward from said band when the hat is worn said hat back having a cloth facing on the side of said hat back which is next to the head when worn and said facing extending from the back sufficiently to provide a selvage strip along the top edge and either side of said hat back:

Attaching a three dimensional figure to said hat back which figure has a fold on its outline of sewable material substantially corresponding to the selvage strip of the facing for attachment directly on said facing of said hat back;

Further attaching the lower part of said figure to said hat band leaving the sides open between the figure and said hat back:

Inserting padding material between said figure and said hat back through said open sides of said figure:

Sewing each of said sides of said figure to said band to enclose the padding material between said figure and said hat back and said band: and

Affixing a hat bill to said band.

4,545,314

CONTROL SYSTEM FOR SEWING MACHINES

Katsuhiro Fujikawa, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1983, Ser. No. 560,079
Claims priority, application Japan, Dec. 9, 1982, 57-216225
Int. Cl.[4] D05B *69/26*
U.S. Cl. 112—275 **5 Claims**

1. A control system for a sewing machine, comprising:

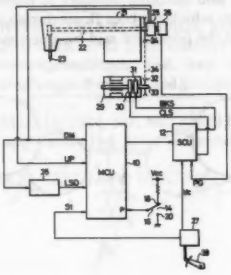
(a) a drive mechanism for driving the sewing machine;

(b) a brake mechanism for braking the sewing machine;

(c) control means for controlling said drive and brake mechanisms; and

(d) detector means for generating signals indicative of detected positions of a needle of the sewing machine and a signal indicative of a detected speed of operation of the sewing machine, said control means comprising selector means for selecting either one of the options of detecting

a predetermined stop-ready speed reached by the speed of operation of the sewing machine with a program stored in



said control means or detecting such a stop-ready speed with an external signal issued from said detector means.

4,545,315

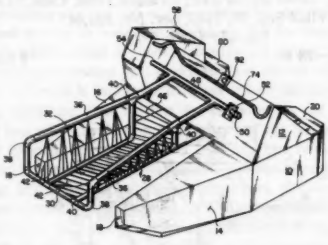
REMOTE CONTROL WATER FOWL RETRIEVING DEVICE

Daryl Becherer, 2015 Camp Jackson Rd., Cahokia, Ill. 62206

Filed Jun. 21, 1984, Ser. No. 623,150

Int. Cl.[4] B63B *1/00*

U.S. Cl. 114—61 **18 Claims**



1. A remotely controllable water supported device for retrieving objects such as water fowl from an open water surface comprising a housing structure including a pair of spaced apart buoyant pontoon portions having forward and rear ends, and a housing portion connected between the pontoons adjacent to the rear ends thereof, a scoop structure having an open front end, spaced opposite open sides and an open rear end, means connecting the scoop adjacent to the rear end thereof to the housing portion for movement relative thereto in the space between the pontoon portions, scoop drive means in the housing portion operatively connected to the means connecting the scoop structure to the housing portion to affect movements of the scoop structure, control means for the device and for the scoop drive means including a drive motor having a propeller attached thereto and means mounting the drive motor to the housing portion in the space between and below the pontoon portions adjacent the rear ends thereof, steering means pivotally connected to the housing portion and extending downwardly therefrom, motor means in the housing portion operatively connected to the steering means, a source of energy in the housing portion and means for selectively connecting the source of energy to energize the drive motor, the motor means and the scoop drive means, said means for selectively connecting including a control circuit having means for receiving a control signal transmitted thereto and means for demodulating the control signals received thereby into responses for energizing and deenergizing the drive motor, the motor means and the drive means to cause a desired operation to take place.

4,545,316

MARINE FENDERS

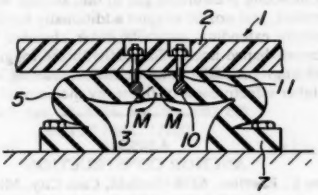
Ikutoshi Yamaguchi, Chigasaki, and Shinichi Kajigaya, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,192

Claims priority, application Japan, Aug. 12, 1982, 57-139192

Int. Cl.[4] B63B *59/02*

U.S. Cl. 114—219 **20 Claims**



1. A marine fender comprising; a shock receiving portion provided at its outer surface with a shock receiving plate, a supporting portion extending from said shock receiving portion toward a quay wall, a flanged base portion protruding sidewards from said supporting portion, said shock receiving, supporting and flanged base portions being formed of a rubbery elastic material, at least one rod member embedded in the center of said shock receiving portion parallel to a side edge thereof and connecting members coupling said rod member to said shock receiving plate.

4,545,317

DEVICE FOR TREATING THE SURFACES OF STRUCTURES AND SHIPS

Uwe Richter, Lüneburg, and Hans Kellershofen, Hamburg, both of Fed. Rep. of Germany, assignors to GKSS-Forschungszentrum Geesthacht GmbH, Geesthacht-Tesperhude and H. Lorenz GmbH, Hamburg, both of, Fed. Rep. of Germany

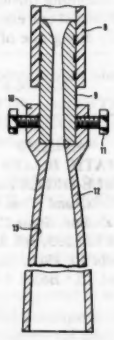
PCT No. PCT/DE82/00070, § 371 Date Nov. 30, 1982, § 102(e) Date Nov. 30, 1982, PCT Pub. No. WO82/03346, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 29, 1982, Ser. No. 445,498

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113028

Int. Cl.[4] B63B *59/08*

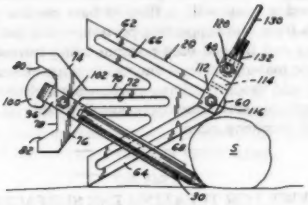
U.S. Cl. 114—222 **6 Claims**



1. A device for treating the surfaces of structures and ships, even under water, with a spray medium which cleans, preserves, or coats, and is sprayed onto the surface which is to be treated by means of a pressurized-gas flow, said device comprising in combination therewith:

a source of pressurized gas;
an at least partially flexible conduit, which is operatively connected to said source of pressurized gas and leads to a work location for conveying spray-medium-conducting pressurized gas thereto;
an outlet nozzle, in the form of a Laval nozzle, provided at an end of said conduit remote from said source of pressurized gas; and
an additional funnel-shaped nozzle adapter attached to said outlet nozzle for effecting delivery of said spray-medium-conducting pressurized gas to said surface which is to be treated; said nozzle adapter additionally having a longitudinally extending, parabolic inner chamber therein, said funnel-shaped nozzle adapter with the longitudinally extending, parabolic inner chamber having considerably higher effectiveness of the spray medium.

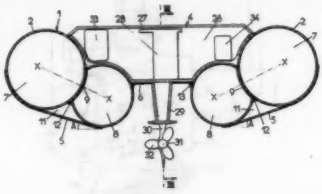
4,545,318
ANCHOR CONSTRUCTION
William C. Eberline, 6378 Garfield, Cass City, Mich. 48726
Filed Feb. 21, 1984, Ser. No. 582,127
Int. Cl.⁴ B63B *21/36*
U.S. Cl. 114—299 **3 Claims**



1. An anchor combination to achieve cable tension release which comprises:
(a) a center plate having a closed V-shaped slot with legs disposed at a predetermined angle to a first axis, with the bight of the V extending in a first direction,
(b) a tail portion on said center plate extending on said first axis in a direction opposite said first direction and having spaced stop extensions on either side of said first axis,
(c) an anchor blade pivoted on said tail portion adjacent said stop extensions having a stop lobe to cooperate with said stop extensions to limit the pivoting of said anchor blade and said center plate relative to each other,
(d) a traveling bolt extending through said V-shaped slot,
(e) a slide member affixed at one end to said bolt to slide with said bolt selectively along one of said legs of said V-slot, and
(f) means to fasten said slide member at the other end to an anchor cable.

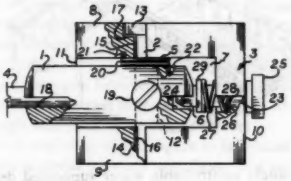
4,545,319
PNEUMATIC BOATS OF THE INFLATABLE-DEFLATABLE TYPE
Michel Ferronniere, Paris, and Yves Cros, Asnieres, both of France, assignors to Zodiac, Saint-Cloud, France
Continuation of Ser. No. 927,395, Jul. 24, 1978, abandoned. This application Sep. 10, 1980, Ser. No. 185,938
Int. Cl.⁴ B63B *7/00*
U.S. Cl. 114—345 **19 Claims**

1. A pneumatic boat, comprising an inflatable member having two arms which extend along the sides of the boat and are connected to each other in the region of the front of the boat, each of said arms including a pair of elongated inflatable components which are joined to one another along at least a part of their respective lengths, and each of said arms further including a sheet-like element on the outer side thereof affixed to and extending between the respective components and defining an acute angle with the horizontal, said arms defining a gap with one another; a bridging member mounted on said arms and bridging said gap, said bridging member being arranged at a level such that said bridging member is normally clear of a body of water on which the boat floats during both movement and stoppage of the boat, and said bridging member and said



arms defining a space bounded by said bridging member from above and having a substantially unobstructed lower side and normally partly filled with water during flotation of the boat; a keel in the region of the front of the boat; and a transverse member interconnecting said arms in the region of the rear of the boat and adapted to carry motor means for propelling the boat.

4,545,320
FLAG RAISING DEVICE FOR WATER SKIING
Brett Lewis, 23203 Faisant Ct., Valencia, Calif. 91355, and Van N. Fellner, 12661 Byron Ave., Granada Hills, Calif. 91342
Filed Sep. 16, 1983, Ser. No. 532,667
Int. Cl.⁴ G09F *17/00*
U.S. Cl. 116—28 R **4 Claims**



1. A flag raising device for a water skier's towing boat, the device comprising:
a housing adapted to be mounted on the rear of a boat;
said housing having a slot open at one end;
a pivot pin;
a generally cylindrical pivot arm which is pivotally mounted at one end in said slot on said pivot pin;
said pivot pin passing through a diametric bore in said pivot arm and extending transversely across said slot;
said pivot arm extending out of said slot and being rotatable between a raised, generally vertical position and a lowered position;
said pivot arm having a first axial bore in said one end, and a second axial bore in the opposite end;
a flag pole;
said flag pole mounted in said second axial bore;
spring bias means acting between said housing and said pivot arm for urging said pivot arm towards said raised position; and
a locking pin for normally holding said pivot arm in said lowered position;
said locking pin movable normally between a locking positon in which it is in locking engagement in said first axial bore so as to hold said pivot arm against rotation from said lowered position, and a released position in

which said first axial bore is disengaged and pivot arm is free to rotate to said raised position.

4,545,321

VACUUM BOX WITH VARIABLE STAGE VOLUME TO IMPROVE COATING UNIFORMITY

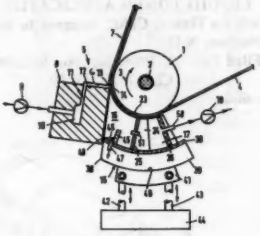
Altan Bassa, Dreieich-Sprendlingen, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 16, 1984, Ser. No. 590,512

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309343

Int. Cl.[4] C23C *13/08;* B05C *3/02*

U.S. Cl. 118—50 13 Claims



1. An apparatus for the application of at least one cast layer on a moving sheet-shaped substrate comprising, in combination, a rotating casting roll which guides the substrate, a pouring vessel having at least one discharge slot for liquid casting material, which vessel is positioned adjacent to the casting roll while leaving a casting gap, and a suction device adjacent the casting roll, which functions to draw off air entrained by the moving substrate, said suction device being in the form of a curved box wherein the top and bottom of the box each lies in a plane concentric to the casting roll, said box having a housing, a low pressure chamber and a vacuum chamber in said housing, and a partition between chambers, the low pressure chamber extending in circumferential direction from the gap to the partition, and the vacuum chamber extending from the partition to an end wall provided with extensions running along the front sides of the low pressure chamber, further characterized in that the partition (25) and/or the end wall (26) can be adjusted in circumferential direction.

4,545,322

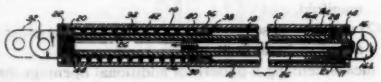
CONSTANT DRAG DEVICE

Elmer C. Yang, Orange, Calif., assignor to Pacific Scientific Company, Anaheim, Calif.

Filed Nov. 23, 1982, Ser. No. 443,880

Int. Cl.[4] B65H *59/10*

U.S. Cl. 188—67 20 Claims



1. A device for providing a substantially constant drag or resistance to movement comprising:

an inner member;

a sleeve frictionally gripping said member, said sleeve being constructed such that it can be axially stretched to reduce its diameter to increase its grip on the inner member;

spring means for providing an opposing force on one end of said sleeve to resist movement of the sleeve produced by moving said inner member in a sleeve streching direction against the force of the spring means, the other end of said sleeve being movable with the inner member relative to said spring in the sleeve stretching direction; and

means limiting movement of said sleeve other end in the direction opposing the spring force whereby further movement of the inner member and said other sleeve end against the urging of said spring means will unload said spring means sufficiently to reduce the stretching and, thus, the gripping force of said sleeve on said member sufficiently to permit the member to slide relative to said sleeve.

4,545,323

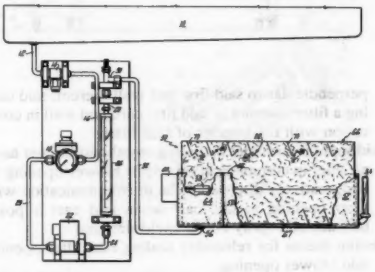
FELT APPLICATOR

Steven F. Keys, Churubusco, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 20, 1984, Ser. No. 602,250

Int. Cl.[4] B05C *11/00*

U.S. Cl. 118—268 10 Claims



1. Apparatus for uniformly applying a fluid to a moving wire which comprises:

a tank which is partially filled with a fluid;

means for supplying fluid to the tank;

a felt applicator;

means for securing the felt applicator in an upright position with the applicator having an absorption portion immersed in the solution and an application portion extending above the tank; and

said felt applicator defining at least one slit means including an entry slit extending downwardly from the top of the applicator within the application portion and an angle slit extending upwardly from the entry slit, said moving wire being positioned within the slit means such that the slit acts to secure the wire in position and the felt applicator acts to coat the wire with fluid wicked through the felt from the tank.

4,545,324

POWDER SPRAY BOOTH AND INTERCHANGEABLE COLLECTORS

Jess Browning, 4217 Via Pinzon, Palos Verdes Estates, Calif. 90210

Filed May 9, 1984, Ser. No. 608,496

Int. Cl.[4] B01D *46/04;* B05B *15/04*

U.S. Cl. 118—634 13 Claims

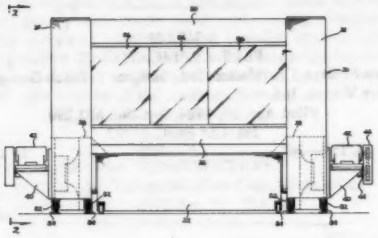
1. A powder spray booth for use in spraying articles hanging on a conveyor and passing therethrough comprising:

a support structure;

a spray booth enclosure supported in an elevated position at opposite ends thereof by said support structure, said enclosure having first and second sides, a pair of end walls and a top, said end walls and said top having openings therein for the free passage of an article to be sprayed and its conveyor support along a conveyor transport path through one end wall, through one end wall, through said enclosure and out the other end wall;

at least one powder recovery cart, said powder cart having

first and second side walls, first and second end walls and a bottom coupled to define an open top receptacle for powder, said cart having wheels thereon and being rollable on said wheels under said spray booth enclosure in a direction substantially normal to said conveyor transport path from either side thereof so that said first and second end walls thereof are adjacent respective portions of said support structure, said cart having at least one cylindrical filter mounted therein with the axis of said filter being



perpendicular to said first end wall thereof, said cart having a filter opening in said first card end wall in communication with the interior of said filter;

said support structure including an exhaust blower having an air inlet in communication with a blower opening therein cooperatively disposed to be in communication with said filter opening in said cart when said cart is positioned beneath said spray booth enclosure; and

sealing means for releasably sealing said filter opening and said blower opening.

4,545,325

DEVELOPING APPARATUS

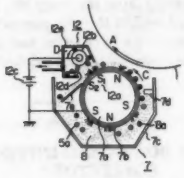
Isamu Komatsu, Takahagi; Masayasu Anzai, Hitachi; Nobuyoshi Hoshi, Katsuta, and Susumu Akimaru, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 523,859

Claims priority, application Japan, Aug. 23, 1982, 57-144700

Int. Cl.[4] G03G *15/01*

U.S. Cl. 118—645 **10 Claims**



1. A developing apparatus for developing, by a second toner of a second developer, a second electrostatic latent image formed on a recording medium carrying a first toner image formed by a first toner attracted to a first electrostatic latent image on said recording medium, said apparatus comprising second developing means for developing with said second toner of said second developer said second electrostatic latent image formed on said recording medium, said second developing means including a developer container for accommodating said second developer and means for carrying said second developer in said developer container to said recording medium to develop said second electrostatic latent image on said recording medium; and mixed toner removal means for removing first toner, which is mixed in the second developer including the second toner and which is charged in the polarity different from the second toner, said removal means including an electrostatic attraction electrode which is supplied with a voltage of the same polarity as the second toner, to thereby remove the first toner from the second developer, and a non-magnetic rotary sleeve disposed in opposition to said electrostatic attraction electrode, magnet means being provided at the inside of said rotary sleeve so as to attract the second developer to the outer periphery of said rotary sleeve, said magnet means being provided with a plurality of magnetic poles of the same polarity formed closely to each other at a position opposed to said electrostatic attraction electrode.

4,545,326

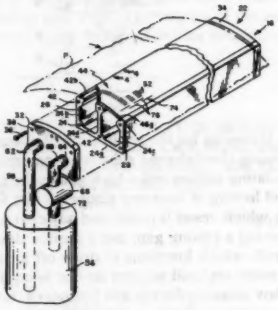
LIQUID TONER APPLICATOR

Norman J. Carl, La Habra, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 23, 1984, Ser. No. 582,698

Int. Cl.[4] G03G *15/10*

U.S. Cl. 118—660 **17 Claims**



1. A liquid toner applicator comprising

A. a plate having a surface for supporting and distributing liquid toner to the surface of a recording medium, said plate being composed of a lamination of thin sheet layer, the outermost layer of the plate being adjacent to the surface of the recording medium;

B. means in said outermost layer of the plate defining a pattern of openings extending through that layer to said surface at locations spaced over said surface;

C. means in the innermost layer of the plate defining first and second sets of openings through said innermost layer, each of said first and second sets of openings containing fewer openings than are present in said pattern of openings in said outermost layer;

D. a dual channel manifold;

E. means for mounting said plate to said manifold so that

(1) said first set of openings are open to one channel of the manifold, and

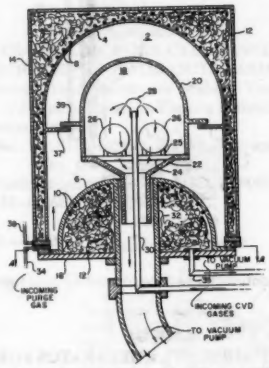
(2) said second set of openings are open to the other channel of said manifold; and

F. means defining a pattern of additional openings through each of the remaining layers of said plate between said outermost and innermost layers, said additional openings being shaped and positioned in their respective layers so that they combine in the lamination of layers to produce a first network of pathways communicating between said first set of openings and first locations in the openings of said pattern of openings in said outermost layer and a second network of pathways different from the first communicating between second locations in the openings of said pattern of openings in said outermost layer and said second set of openings.

4,545,327
CHEMICAL VAPOR DEPOSITION APPARATUS

Bryant A. Campbell, Los Gatos, and Nicholas E. Miller, Cupertino, both of Calif., assignors to Anicon, Inc., San Jose, Calif.

Filed Aug. 27, 1982, Ser. No. 412,237
Int. Cl.[4] C23C *13/08*
U.S. Cl. 118—719 11 Claims

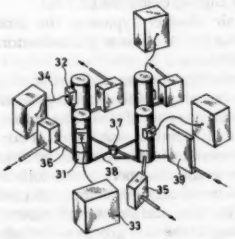


1. A controlled temperature deposition device comprising radiant heating means substantially surrounding an inner deposition reaction chamber for providing precisely controlled, isothermal temperature conditions therein, the inner deposition reaction chamber having gas distribution means for introducing gas into the inner deposition reaction chamber and removing gas therefrom, and vacuum chamber means surrounding the inner deposition reaction chamber and spaced from the walls thereof for maintaining a medium vacuum therein, the inner deposition reaction chamber being defined by inner walls means spaced apart from said vacuum chamber means for containing the reaction gases within the inner deposition reaction chamber.

4,545,328
PLASMA VAPOR DEPOSITION FILM FORMING APPARATUS

Yasutomo Fujiyama, and Shotaro Okabe, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,608
Claims priority, application Japan, Sep. 9, 1958, 58-168377
Int. Cl.[4] C23L *13/08*
U.S. Cl. 118—723 2 Claims



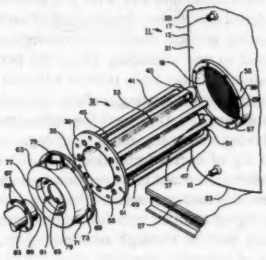
1. A vapor deposition film forming apparatus having a plurality of reactors each having a substrate and an electrode oppositely arranged in a vacuum chamber and means for applying a voltage thereacross to react or decompose reaction gas introduced into said vacuum chamber,

characterized by that center axis of said reactors are arranged on a circumference of a circle and reaction gas supply pipes having substantially equal supply resistance radially extend to said reactors from a gas reservoir located at a center of said circle.

4,545,329
WATER HEATER

Charles L. Adams, Fort Worth, Tex., assignor to PVI Industries, Inc., Fort Worth, Tex.

Continuation of Ser. No. 534,402, Sep. 23, 1983, Pat. No. 4,465,024, which is a continuation of Ser. No. 369,207, Apr. 16, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,128
The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.
Int. Cl.[4] F22B *5/00*
U.S. Cl. 122—17 19 Claims



1. A readily removable and submergible combustion chamber assembly for a gas or oil fired water heater of the type having a closed tank normally containing water under pressure with a sidewall extending between the top and bottom of the tank and an opening in the sidewall, said combustion chamber assembly comprising:

a submergible, pressurized combustion chamber portion with multiple external heating surfaces, said chamber portion normally extending through the sidewall opening of the closed water tank so that all of said heating surfaces are submerged in the water under pressure;

means for readily removing and installing the combustion chamber assembly in the opening, said means comprising a mounting portion for detachably but sealingly engaging the tank opening;

said combustion chamber portion comprising a substantially cylindrical body portion having an open end located adjacent said mounting portion which communicates with the exterior of the water tank and a closed end at the opposite end of said body portion;

said mounting portion comprising first mounting flange means connected to and extending about the periphery of said open end of said combustion chamber body portion;

said multiple external heating surfaces including a multiplicity of substantially U-shaped fire tubes of substantially smaller diameter than and substantially evenly spaced about the entire periphery of said cylindrical body portion, each of said fire tubes having a long leg and a short leg;

said short leg of each of said fire tubes extending through said closed end of said body portion to communicate with the interior of said combustion chamber portion at said closed end;

said long leg of each of said fire tubes extending adjacent said body portion through said mounting flange means; and

a flue collector mounted on the exterior of the water tank and having a flue opening therein which communicates with said open end of said body portion, said flue collector having an annular chamber surrounding said flue opening

and separated therefrom, said annular chamber communicating with said long leg of each of said fire tubes through said flange means, said annular chamber having a flue outlet therein.

19. Apparatus for heating water, which comprises:

a closed tank normally containing water under pressure and having a wall and an opening in said wall;

a combustion chamber assembly having a submergible, pressurized combustion chamber portion with multiple external heating surfaces, said combustion chamber portion extending through said opening of said closed tank so that all of said multiple external heating surfaces are submerged in said water under pressure;

said combustion chamber assembly including a mounting portion for sealingly engaging said tank opening;

said combustion chamber portion comprising a body portion having an open end located adjacent said mounting portion which communicates with the exterior of said tank and a closed end at the opposite end of said body portion;

said mounting portion comprising mounting flange means connected to and extending about the periphery of said combustion chamber body portion adjacent said open end;

said multiple external heating surfaces including a multiplicity of substantially U-shaped fire tubes, each of said fire tubes having a long leg and a short leg;

said short leg of each of said fire tubes extending through said closed end of said body portion to communicate with the interior of said combustion chamber at said closed end;

said long leg of each of said fire tubes extending adjacent said body portion through said mounting portion to the exterior of said tank;

a forced draft burner mounted on the exterior of said tank and communicating with said combustion chamber opening for causing combustion to take place within said body portion of said submergible, pressurized combustion chamber portion so that substantially all combustion takes place within said tank to minimize heat loss; and

a flue collector mounted on the exterior of the closed tank and having a flue opening therein which communicates with said open end of said body portion, said flue collector having an annular chamber surrounding said flue opening and separated therefrom, said annular chamber communicating with said long leg of each of said fire tubes through said flange means, said annular chamber having a flue outlet.

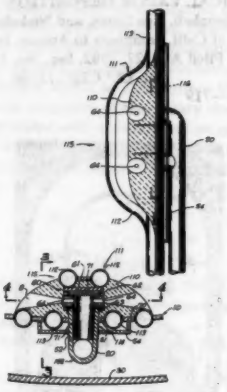
4,545,330

SELF-CLEANING LINER

Russell B. Covell, Granby, and Andrew F. Kwasnik, Ellington, both of Conn., assignors to Cool Water Coal Gasification Program, Daggett, Calif.

Filed Apr. 10, 1984, Ser. No. 598,729
Int. Cl.⁴ F22B *37/52, 37/54*
U.S. Cl. 122—392 **13 Claims**

1. A self-cleaning liner comprising a tubular liner having tubular liner tubes for transporting a heat exchange medium which are joined together to form a continuous surface and a sprayhead assembly, wherein one of said tubular liner tubes is bent to form a bump in said tubular liner, said bump extending into the interior of the area defined by said tubular liner tubes creating a cavity between itself and said tubular liner; and said sprayhead assembly is disposed within said cavity directly behind said bump, oriented such that it can spray a fluid on the



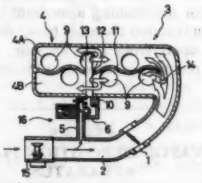
interior of said continuous surface formed by said tubular liner tubes.

4,545,331

AUXILIARY AIR SUPPLY APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Masafumi Ito, Yokosuka; Shuichi Nishimura, Yokohama, and Yoichi Hara, Hiratsuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 11, 1984, Ser. No. 619,199
Claims priority, application Japan, Jun. 15, 1983, 58-107263
Int. Cl.⁴ F02M *35/00*
U.S. Cl. 123—26 **18 Claims**



1. In an internal combustion engine which includes an intake duct with a throttle valve and an intake manifold provided in the downstream side of the intake throttle valve, the intake manifold having a collector section the internal section of which is divided into a plurality of chambers, an auxiliary air supply apparatus for supplying auxiliary air to a plurality of cylinders of the engine, comprising:

an auxiliary air channel bypassing the throttle valve for supplying the auxiliary air to the collector section of the intake manifold; and

means for uniformly feeding and distributing the auxiliary air into the chambers of the collector section;

wherein said auxiliary air distributing means comprises an auxiliary air distribution pipe which is connected to said auxiliary air channel and is arranged to directly supply the auxiliary air to the chambers of the collector section;

wherein the internal section of the collector section is divided into the first and second chambers by a partition corresponding to the two groups of cylinders each group of which has a continuous ignition order;

wherein the auxiliary air distribution pipe has auxiliary air distribution ports in the position corresponding to the first and second chambers, and

wherein said auxiliary air channel has an inlet which communicates to the intake duct in the upstream side of the intake throttle valve and an outlet which communicates to

the collector section of the intake manifold in the downstream side of the intake throttle valve, the auxiliary air distribution pipe is in the form of a tube and closed off at one end and has a flange mounted on its open end, the open end of the pipe being communicated to the outlet of said auxiliary air channel, the closed end of the pipe extending through the first chamber and a balancing hole of the partition and being positioned in the second chamber.

4,545,332

WATER-COOLED, FOUR-CYCLE INTERNAL COMBUSTION ENGINE FOR OUTBOARD MOTORS

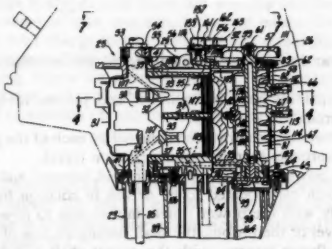
Tomonori Suzuki, Hamamatsu, and Makoto Toyohara, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Division of Ser. No. 414,040, Sep. 2, 1982,. This application Mar. 14, 1984, Ser. No. 589,227

Claims priority, application Japan, Oct. 10, 1956, 56-142659; 56-142660; 56-142661; 56-142662

Int. Cl.⁴ F01P *11/06*

U.S. Cl. 123—41.01 **8 Claims**



1. In a cooling system for a water-cooled internal combustion engine for an outboard motor or the like comprising a casting forming a component of the engine, said casting having a cooling jacket defined at least in part by a wall thereof, and an opening in said wall for supporting a core or the like for forming said cooling jacket during casting, the improvement comprising a sacrificial anode supported by said wall in proximity to said opening during use of said casting as a component of the engine.

4,545,333

SYSTEM FOR CONTROLLING COOLANT TEMPERATURE OF INTERNAL COMBUSTION ENGINE

Shinichi Nagumo; Yoshio Toda, both of Yokohama; Yasuo Nakajima, Yokosuka, and Yoshifumi Hase, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 6, 1984, Ser. No. 617,741

Claims priority, application Japan, Jun. 8, 1983, 58-101950

Int. Cl.⁴ F01P *7/16*

U.S. Cl. 123—41.02 **7 Claims**

1. A system for controlling temperature of coolant circulating through an engine main body of an internal combustion engine having a plurality of operating conditions, comprising:

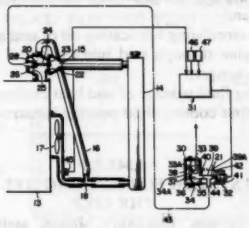
a coolant circulating circuit including a radiator, an outlet passage passing a relatively hot coolant from the engine main body to said radiator, an inlet passage passing a relatively cool coolant from said radiator to the engine main body and a bypass passage having one end connected to said outlet passage and an opposite end connected to said inlet passage for passing the relatively hot coolant directly to the relatively cool coolant bypassing said radiator;

a temperature sensor means, disposed in said coolant circulating circuit, for sensing an actual coolant temperature of the coolant in said coolant circulating circuit and generating an actual coolant temperature indicative signal indicative of the sensed actual coolant temperature;

means for storing coolant temperature values corresponding, respectively, to said plurality of operating conditions of the engine;

means for detecting a present operating condition of the internal combustion engine and generating an operating condition indicative signal indicative of the detected operating condition;

means for retrieving the coolant temperature value corresponding to the detected operating condition of the engine indicated by said operating condition indicative signal and generating a target coolant temperature indicative signal indicative of said retrieved coolant temperature value;



means for comparing said actual coolant temperature indicative signal with said target coolant temperature indicative signal and generating a result indicative signal indicative of the result of said comparison; and

means responsive to said result indicative signal for controlling the flow rate of coolant passing through said radiator in such a manner as to decrease a difference between said actual coolant temperature indicative signal and said target coolant temperature indicative signal.

4,545,334

LUBRICATING OIL COOLING SYSTEM FOR REAR OR MID ENGINED VEHICLE

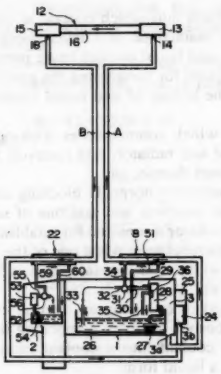
Takayoshi Nakagawa, and Tadao Hasegawa, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 1, 1984, Ser. No. 605,822

Claims priority, application Japan, Oct. 14, 1983, 58-192224

Int. Cl.⁴ F01P *11/08*

U.S. Cl. 123—41.33 **8 Claims**



1. A cooling system for lubricating oil of an internal combustion engine of a vehicle having a passenger compartment; a liquid cooled internal combustion engine mounted at least partly behind said passenger compartment with regard to a forward moving direction of said vehicle, a cooling fluid jacket for circulation of cooling fluid therethrough for cooling said internal combustion engine; a radiator for cooling the cooling fluid and which is mounted in front of said passenger compartment with regard to the forward moving direction of said vehicle; a first cooling fluid passage construction for conducting flow of cooling fluid from said cooling fluid jacket to said

radiator; a second cooling fluid passage construction for conducting flow of cooling fluid from said radiator to said cooling fluid jacket; and means for circulating cooling fluid through a circuit including said cooling fluid jacket, said first cooling fluid passage construction, said radiator and said second cooling fluid passage construction being arranged in series in such order;

said cooling system comprising:

a heat exchanger formed with a cooling fluid passage and a lubricating oil passage arranged to exchange heat therebetween; and

means for circulating lubricating oil of said internal combustion engine through said lubricating oil passage of said heat exchanger;

said cooling fluid passage of said heat exchanger being a part of said first cooling fluid passage construction.

4,545,335

COOLING SYSTEM FOR AUTOMOTIVE ENGINE OR THE LIKE

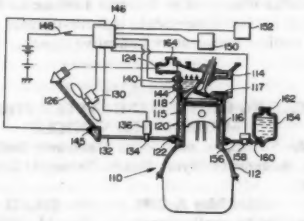
Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1984, Ser. No. 602,451

Claims priority, application Japan, May 19, 1983, 58-86632; Aug. 9, 1983, 58-145467; Aug. 9, 1983, 58-145470

Int. Cl.⁴ F01P *11/02*

U.S. Cl. 123—41.27 **20 Claims**



1. In an internal combustion engine having a combustion chamber

a coolant jacket into which coolant is introduced in liquid form and maintained at a level above said combustion chamber, said liquid coolant being permitted to boil;

a radiator means for condensing the gaseous coolant generated by the boiling of said liquid coolant in said coolant jacket;

a reservoir which communicates with one of said coolant jacket and said radiator, said reservoir being arranged to store coolant therein; and

a control means for normally blocking communication between said reservoir and said one of said coolant jacket and said radiator means and for establishing fluid communication therebetween when one of the pressure and temperature within said coolant jacket is below a predetermined level.

13. A method of operating an internal combustion engine having a combustion chamber comprising the steps of:

introducing coolant into a coolant jacket formed in said engine in a liquid form;

using said liquid coolant to absorb heat produced by said engine and converting said liquid coolant into its gaseous form;

condensing the gaseous coolant generated in said coolant jacket in a radiator;

storing a predetermined amount of coolant in a reservoir;

introducing the coolant stored in said reservoir into said coolant jacket and radiator to fill same when one of the pressure and temperature in said radiator and coolant jacket tend to fall below a first predetermined level.

4,545,336

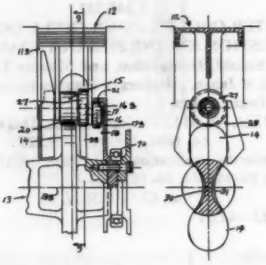
ENGINE WITH ROLLER AND CAM DRIVE FROM PISTON TO OUTPUT SHAFT

William M. Waide, Pasadena, Calif., assignor to BCDS Corporation, Temecula, Calif.

Filed Oct. 1, 1984, Ser. No. 656,682

Int. Cl.⁴ F02B *75/22*

U.S. Cl. 123—55 AA **5 Claims**



1. In an internal combustion engine, the combination comprising

(a) a pair of opposed cylinders and pistons reciprocating therein,

(b) power and return rollers carried by each of the pistons to reciprocate therewith during piston travel,

(c) a power output shaft having an integral and external driven cam located to be driven in rotation by contact only with the power rollers in response to power stroke travel of the pistons, the shaft having an axis of rotation,

(d) a flange integral with the output shaft and having an internal cam track located to be engaged by the return rollers in response to return stroke travel of the pistons,

(e) said power and return rollers having parallel axes of rotation, the return roller axes located closer to the shaft axis than the power roller axes,

(f) there being a cross head slider and a lateral guide roller also carried by each of the pistons, and guide structure means associated with each cylinder for guiding reciprocating movement of said respective slider and guide roller to contain any lateral movement,

(g) and including a continuous mounting shaft associated with each piston, and mounting each said power roller, each said return roller, each said slider and guide roller, said power roller and guide roller of each piston being located between said slider and return roller of each piston, the power roller located between the slider and guide roller of each piston, said mounting shaft having a first section carrying its respective said slider, power roller and guide roller, and a second section carrying its respective said return roller, the respective power roller axis being coaxial with said first section and the respective return roller axis being coaxial with said second section, said respective axes being parallel and spaced apart.

4,545,337

ROTARY VALVE ENGINE

George A. Lyons, 26053 Elsinore, Redford, Mich. 48239, and David R. Kosa, 10575 Swan Creek, Carleton, Mich. 48117

Continuation of Ser. No. 330,563, Dec. 14, 1981, Pat. No. 4,473,041. This application May 18, 1984, Ser. No. 611,627

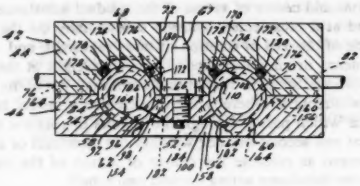
Int. Cl.⁴ F01L *7/16*

U.S. Cl. 123—80 BA **8 Claims**

3. A vehicle engine having at least one cylinder, having a piston moveably disposed therein, comprising

modular cylinder head means disposed substantially at one end of said cylinder, wherein said cylinder, said piston, and said cylinder head means form a working chamber for said engine within each cylinder of said engine, said cylin-

der head means including an inlet port to and an outlet port from each said working chamber of said engine, said modular cylinder head means comprising a base element, an upper and a lower inlet valve housing, an upper and a lower exhaust valve housing, and means for fastening said base element and valve housings together and to said engine; and



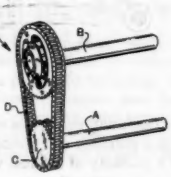
rotary valve means disposed within said cylinder head means comprising rotating means for valving an inlet charge to and exhaust from said working chamber, rotating about at least one axis, including means for porting said inlet charge to said inlet port and means for porting said exhaust from said outlet port, said porting means each having means for manifolding said inlet charge to said inlet port and said exhaust from said outlet port along the axis of rotation of said rotating valving means.

4,545,338

CAM SHAFT TIMING CONTROL DEVICE

Neal C. Allred, III, Rte. 2, Box 68, High Point, N.C. 27260, assignor to Stephen E. Lawing and Neal C. Allred, III, both of High Point, N.C.

Filed Dec. 3, 1984, Ser. No. 677,100
Int. Cl.⁴ F01L *1/34*
U.S. Cl. 123—90.15 **8 Claims**



1. A hydraulically controlled, variable timing device for engine timing cam shafts of the type in which a rotatable cam shaft is arranged parallel to and driven by a rotatable crankshaft through a connecting chain or gear and in which said cam shaft operates the opening and closing of intake and exhaust valves, said variable timing device comprising:

(a) an inner plate secured to the end of said timing cam shaft and having at least one passageway therethrough in communication with the lubrication system of said engine;

(b) an outer plate surrounding the periphery of said inner plate in rotatably adjustable relation thereto and directly connected in synchronous driven arrangement to said crankshaft;

(c) a linking spider means mechanically connecting said inner plate and said outer plate through a toggle linkage and transmitting the driving force from said outer plate to said inner plate;

(d) said inner plate being rotatable to a cam shaft advance position responsive to the application of an axial bias on said linking spider means to move said spider means a first axially extended position during prescribed periods in the timing cycle;

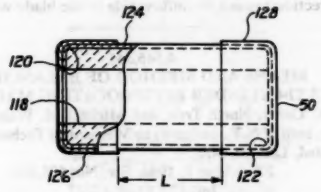
(e) said inner plate being rotated to a cam shaft retard position responsive to frictional drag on the cam shaft combined with the removal of said axial bias on said linking spider which causes a return of said spider means to the retracted position.

4,545,339

GLOW PLUG HAVING A CONDUCTIVE FILM HEATER

Mark A. Brooks, Sterling Heights; Ambrose Tomala, Royal Oak, and Gary L. Casey, Troy, all of Mich., assignors to Allied Corporation, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,909
Int. Cl.⁴ F02P *9/08*; F23Q *7/22*
U.S. Cl. 123—145 A **39 Claims**



25. A glow plug having a metal base and an axial electrode passing through said base and electrically insulated therefrom, a heater member electrically connected between said base and axial electrode characterized by:

a heater member substrate having at least one end structurally supported by said base;

a conductive surface film heater element disposed on at least one surface of said substrate having one end in electrical contact with said base and the other end in electrical contact with said axial electrode; and

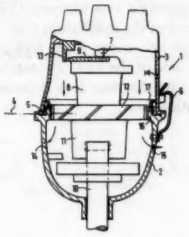
a metal film overlay disposed on said conductive surface film heater element a predetermined distance from each end of said substrate.

4,545,340

IGNITION DISTRIBUTOR FOR AN INTERNAL COMBUSTION ENGINE

Hermann Schreiner, Hemmingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 22, 1984, Ser. No. 623,325
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322545
Int. Cl.⁴ F02P *1/00*
U.S. Cl. 123—146.5 A **5 Claims**



1. An ignition distributor for internal combustion engines, comprising housing means including a distributor housing and a distributor cap detachably secured on said distributor housing, current-interrupting means provided in said distributor cap including an electrode rotating in unison with a distributor shaft and several fixed circumferential electrodes cooperating

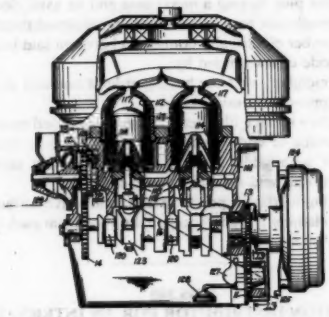
with said rotating electrode, a blade wheel means secured on said distributor shaft which is operable to remove the gases out of the distributor cap into the atmosphere through openings in the housing means, said blade wheel means being arranged between the rotating electrode and an entrainment member of the distributor shaft operatively connected with a drive shaft near the separating plane between the distributor housing and cap and forming together with the entrainment member a unitary structural part, said distributor housing including an annular extension which surrounds the blade wheel means with slight radial clearance and extending substantially over the width thereof, and wherein a nozzle means is provided at the annular extension, said nozzle means becoming narrower in the direction toward the inflow side of the blade wheel means.

4,545,341

MEANS AND METHOD OF BALANCING MULTI-CYLINDER RECIPROCATING MACHINES

John A. Corey, North Troy, and Michael M. Walsh, Schenectady, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 1, 1984, Ser. No. 605,854
Int. Cl.⁴ F16F *15/22*
U.S. Cl. 123—192 B **16 Claims**



1. In combination with a multi-cylinder reciprocating machine of the type including a crankshaft mounted for rotation therein and which crankshaft is counterbalanced throughout so as to be in static and dynamic balance, a balancing system comprising:

(a) only two balance weights each appropriately sized and arranged to eliminate the force imbalance and to minimize the imbalance moments of said reciprocating machine;

(b) the first appropriately-sized balance weight being mounted for rotation at a distance D in an axial direction toward one end of the crankshaft from the center of action of the residual imbalance force and at a preselected distance on one side of the axis of rotation of said crankshaft and wherein said distance D is determined in accordance with the relationship

$$D = \frac{M_{R^-}}{F_{B^-}} \cos \alpha$$

where:

M_{R-} equals the counter rotating component of the reciprocating imbalance moment,

F_{B-} equals the counter rotating balance force which balances the counter rotating component, F_{R-}, of the reciprocating imbalance force,

α equals the acute angle subtended between F_{R-} and F_{MR-}, and

F_{MR-} equals the force components of moment M_{R-} taken as a couple at distances D and $-D$ along the crankshaft axis;

(c) means for driving said first balance weight at the same rotational speed as that of said crankshaft but in the opposite direction;

(d) the second appropriately-sized balance weight being mounted for rotation at said same distance D but in an axial direction toward the opposite end of said crankshaft from said center of action of the residual imbalance force and at a preselected distance substantially on the other side of the axis of rotation of said crankshaft; and

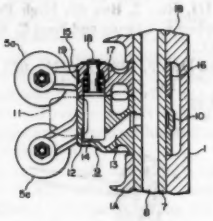
(e) means driving said second balance weight at the same rotational speed as that of said crankshaft but in the opposite direction, whereby there is created a virtual balance axis which passes through the centers of rotation of said first and second balance weights and intersects or as near thereto as possible the center of action of the residual force imbalance acting on said crankshaft.

4,545,342

METHOD AND APPARATUS FOR THE CONTROL OF VALVE OPERATIONS IN INTERNAL COMBUSTION ENGINE

Yoshikatsu Nakano, Saitama, and Masaaki Matsuura, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1984, Ser. No. 596,752
Claims priority, application Japan, Jun. 29, 1983, 58-116061
Int. Cl.⁴ F02B *77/00*
U.S. Cl. 123—198 F **6 Claims**



1. A method for operating the valves of an internal combustion engine having a plurality of cylinders and a plurality of intake valves and a plurality of exhaust valves for each cylinder of said engine, comprising the steps of:

for a low speed of rotation of said engine, placing a part of each of said intake valves and said exhaust valves out of operation;

for a medium speed of rotation of said engine, placing all of said intake valves in operation and a part of said exhaust valves in operation; and

for a high speed of rotation of said engine, placing all intake and exhaust valves in operation.

4,545,343

ANTITHEFT DEVICE FOR VEHICLES

John Cook; Harold Tate, Jr., both of Cottontown, Tenn. 37048, and J. W. Graves, Springfield, Tenn. 37172

Filed Sep. 11, 1984, Ser. No. 649,304
Int. Cl.⁴ B60R *25/04*
U.S. Cl. 123—198 B **4 Claims**

1. In combination with a motor vehicle having an engine, a battery having a first pole and a second pole, and a starter solenoid contactor, wherein said first pole is connected to said vehicle frame and said starter solenoid contactor is connected to said second pole, an antitheft device comprising:

a. an electrical starter assembly having a casing in which is mounted said electrical starter assembly including, electrical means for starting said engine, said electrical

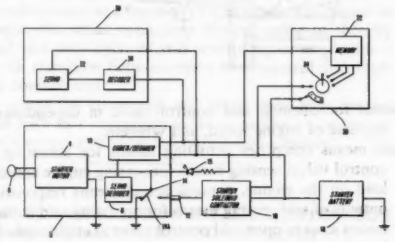
starting means having first and second terminals and means for engaging a flywheel, said first terminal being connected to said vehicle frame,

a grounding contact connected to said vehicle frame,

a power control contact connected to said starter solenoid contactor,

a movable contactor arm resting on said grounding contact when said antitheft device is in a locked mode and contacting said power control contact when said antitheft device is in an unlocked mode, said movable contactor arm being connected to said second terminal of said electrical starting means,

servo means having a link connected for moving said movable contactor arm from the grounding contact to said power control contract, a coder/decoder connected to said servo means;



b. an ignition key switch having third and fourth terminals, wherein said third terminal is electrically connected to said second pole of said battery, and said fourth terminal is electrically connected to said coder/decoder for operating said coder/decoder to generate a first code signal in response to said key ignition switch being in a start position; and

c. a processor having a coder and a memory, said processor being connected between said key ignition switch and said coder/decoder,

said processor including a key pad for generating a second code signal in response to recognizing said first code signal, said processor including means responsive to a correspondence between said first and second code signals for operating said servo means to move said movable contactor arm into engagement with said power control contact to apply current to said starting means.

4,545,344

DIESEL ENGINE HAVING TURBULENT COMBUSTION CHAMBER

Yuji Matuo, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

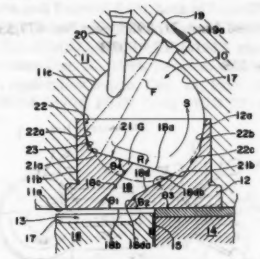
Filed Apr. 17, 1984, Ser. No. 601,351

Claims priority, application Japan, Apr. 30, 1983, 58-76650

Int. Cl.[4] F02B *19/18*

U.S. Cl. 123—286 **8 Claims**

1. In a diesel engine comprising a cylinder head having a turbulent combustion chamber defined therein, a cylinder block having a cylinder bore defined therein, said turbulent chamber being positioned offset laterally of the longitudinal axis of the cylinder bore, a piston reciprocatingly accommodated within the cylinder bore and defining a primary combustion chamber in cooperation with the cylinder head and the cylinder bore, said cylinder head also having a connecting throat defined therein for communicating between the primary chamber and the turbulent chamber, and a fuel injection nozzle for injecting fuel into the turbulent chamber, the improvement wherein the turbulent chamber is constituted by a flat bottom wall and a generally spherical wall, at least a portion of said flat bottom wall being positioned inwardly of the sphere generally represented by the spherical wall and having its periphery inwardly curved and continued to the spherical wall, said bottom wall being downwardly inclined in a direction away from the longitudinal axis of the cylinder bore with a first portion of said bottom wall closest to the longitudinal axis of the cylinder bore being upwardly raised relative to the opposite, second portion thereof remotest from said longitudinal axis of the cylinder bore, wherein said connecting throat has one end opening into the turbulent chamber at a location adjacent said second portion of the bottom wall and the other end opening into the primary chamber at a position adjacent the



periphery of the cylinder bore, the opening of said one end of the throat being larger than that of said other end of the throat, said throat being upwardly inclined relative to the plane perpendicular to the longitudinal axis of the cylinder bore and being tapered towards the primary combustion chamber, the throat having its effective cross-sectional surface area gradually increasing from said other end of the throat towards said one end of the throat, and wherein said injection nozzle is oriented so as to inject fuel in a direction towards that portion of a corner area between the bottom wall and the spherical wall that is adjacent said first portion of the bottom wall.

4,545,345

AIR/FUEL INDUCTION SYSTEM FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

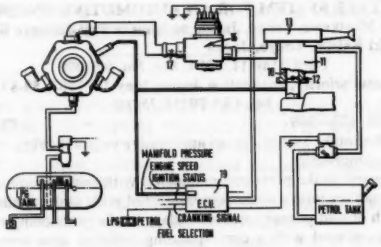
Brian C. Pagdin, and David J. Marriage, both of Dunstable, England, assignors to Solex (U.K.) Limited, London, England

Filed Nov. 28, 1983, Ser. No. 555,406

Claims priority, application United Kingdom, Dec. 1, 1982, 8234310; Dec. 13, 1982, 8235448

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—299 **6 Claims**



1. An air/fuel induction system for a multi-cylinder internal combustion engine comprising an air/fuel induction passage, a driver-operable throttle valve for controlling the flow of air/fuel mixture to cylinders of the engine, fuel injection means operative to deliver metered pulsed outputs of said fuel in a gaseous state directed to a location in the induction passage upstream of the inlet manifold, and electronic control means operative to produce electrical signals to control the duration

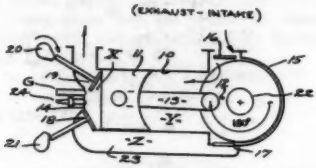
of each pulsed output of fuel from the fuel injection means, the fuel injection means comprising at least two injector valves operated sequentially under control of said electronic control means, such that the commencement of a pulsed output of fuel is synchronized with the operation of the engine, and such that under predetermined engine operating conditions the opening periods of at least two of said valves overlap.

4,545,346

INTERNAL COMBUSTION HEAT ENGINE AND CYCLE THEREFOR

Harlow B. Grow, 16530 Chattanooga Pl., Pacific Palisades, Calif. 90272

Filed Mar. 21, 1983, Ser. No. 477,533
Int. Cl.⁴ F02B *33/04*
U.S. Cl. 123—305 **12 Claims**



1. An internal combustion heat engine cycle for a reciprocating engine unit, and including;

admitting intake air into a separate compression chamber continuously during a full stroke of a piston,

charging a transfer chamber with compressed combustion support air from the compression chamber and storing it therein during a first power stroke of the piston,

transferring a portion of the compressed combustion support air from the transfer chamber and into a combustion chamber during the initial portion of first power stroke of the piston,

injecting fuel into the combustion chamber to admix with the compressed combustion support air transferred therein,

igniting the admixture of fuel and compressed combustion support air to effect the first power stroke of the piston,

and discharging burnt gases from the combustion chamber while simultaneously admitting the aforesaid intake air into the compression chamber during a second reciprocal exhaust stroke of the piston.

4,545,347

INTAKE SYSTEM FOR AN AUTOMOTIVE ENGINE

Kouji Morikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1984, Ser. No. 609,090
Claims priority, application Japan, May 12, 1983, 58-83183
Int. Cl.⁴ F02M *35/10*
U.S. Cl. 123—308 **2 Claims**

1. An intake system for an automotive engine having cylinders, comprising:

primary intake ports communicated with said cylinders;

secondary intake ports communicated with said cylinders;

each of said primary and secondary intake ports being communicated with a corresponding cylinder at a common intake valve;

each primary intake port being disposed in a tangential direction so as to provide a swirl of induced mixture;

a primary intake manifold communicated with said primary intake ports;

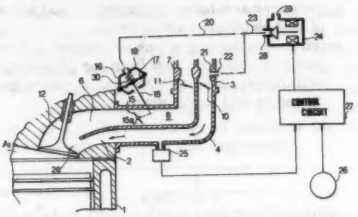
a secondary intake manifold communicated with said secondary intake ports;

a primary carburetor having a throttle valve provided in said primary intake manifold;

a secondary carburetor having a throttle valve provided in said secondary intake manifold;

said throttle valve of the secondary carburetor being so arranged to be opened after the throttle valve of the primary carburetor has been fully opened;

a control valve provided in each branch of said secondary intake manifold for controlling a counter flow of inducted mixture;



means for opening said control valve in dependence on increase of engine speed, and wherein

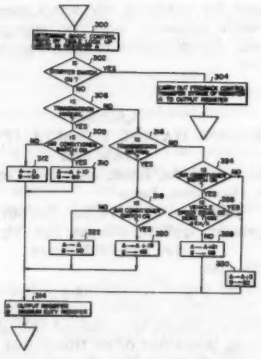
said means comprises actuating means for actuating said control valve, sensing means for sensing engine speed and load on the engine, control circuit means responsive to outputs of said sensing means for operating said actuating means so as to open said control valve as engine speed and load increase.

4,545,348

IDLE SPEED CONTROL METHOD AND SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Kenji Ikeura, Yokosuka, Japan, assignor to Nissan Motor Company, Ltd., Japan

Division of Ser. No. 393,081, Jun. 28, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 506,325
Claims priority, application Japan, May 22, 1979, 54-62204; May 25, 1979, 54-64841
Int. Cl.⁴ F02B *3/00*; F02D *1/04, 9/02*
U.S. Cl. 123—339 **14 Claims**



1. An intake air flow rate control system for an automotive vehicle internal combustion engine which selectively carries out either feedback control or open loop control depending upon engine operating conditions and wherein smooth transition between open loop control and feedback control of intake flow rate is effected, said system including an auxiliary air control valve with an electromagnetically operable actuator which is operated in response to a variable duty cycle control signal applied thereto to control the ratio of the energized and

deenergized periods of said actuator corresponding to duty cycle of said control signal;

wherein said system comprises:

sensor means for measuring engine temperature and in response generating a sensor signal representative of the measured engine temperature;

means for measuring engine load and for generating an engine load signal in response thereto;

first means for detecting engine driving conditions and for which open loop control of intake air flow rate is required;

second means responsive to said sensor signal for determining an initial open loop control value of said auxiliary air control valve and generating said control signal to be applied to said actuator means, said variable duty cycle control signal having a duty cycle defined by said control value and defining the ratio of the energized period and the deenergized period of said actuator;

third means for generating repetitively a predetermined correction value as a function of said engine load signal to correct said initial open loop control value to thereby adjust said duty cycle of said control signal to provide a smooth transition between open loop control and feedback control; and

fourth means for correcting said initial open loop control value with said correction value to produce a corrected open loop control value to control said actuator.

4,545,349

METHOD FOR REGULATING INTAKE AIR FLOW FOR INTERNAL COMBUSTION ENGINES

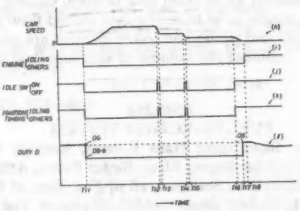
Yoshiyasu Ito; Toshio Suematsu; Yuji Takeda, and Katsushi Anzai, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 7, 1984, Ser. No. 577,840

Claims priority, application Japan, Feb. 16, 1983, 58-24258

Int. Cl.⁴ F02D *1/04*

U.S. Cl. 123—339 **6 Claims**



1. A method for regulating intake air flow for internal combustion engine which comprises:

providing an idle switch connected to a throttle valve for detecting the closed condition of the throttle valve and outputting an ON signal;

providing an idling detector means to determine an idling condition of the internal combustion engine after said idling switch outputs an ON signal and detection of the speed of the car as zero;

providing an intake air flow control means for controlling the amount of air flow sent to a combustion chamber by bypassing the throttle valve; said method comprising the additional steps of

(a) outputting a feed back control signal to the intake air flow control means for adjusting the number of engine rotations to the predetermined target number of engine rotations;

(b) outputting a first holding control signal to the intake air flow control means for holding the intake air flow amount sent by bypassing the throttle valve less than a memorized learning intake air flow amount by a predetermined air flow amount just before the feed back control terminates, when the engine is not in the condition of idling and the idle switch outputs an OFF signal; and

(c) outputting an ignition control signal for setting the ignition timing for an idling engine, when the internal combustion engine is in the condition of idling, or when the internal combustion engine is not in the condition of idling and the idle switch outputs an ON signal.

4,545,350

FUEL CONTROLLER OF VARIABLE CHOKE CARBURETOR

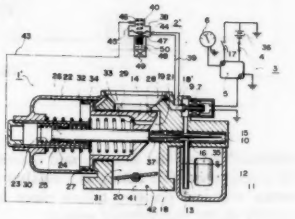
Norihiko Nakamura, and Takashi Kato, both of Mishima, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 437,476, Oct. 28, 1982, abandoned. This application Oct. 30, 1984, Ser. No. 665,505

Claims priority, application Japan, Dec. 15, 1981, 56-201005

Int. Cl.⁴ F02M *23/04;* **F02N** *7/00;* **F02B** *75/10*

U.S. Cl. 123—439 **5 Claims**



1. A fuel controller for a variable-venturi carburetor for preventing engine run-on when the ignition switch is turned off comprising:

an air-bleed passage provided between a well of said variable-venturi carburetor and an air horn;

a solenoid-operated valve connected to said air-bleed passage between said well and air horn, said solenoid-operated valve acting to open or close said air bleed passage in response to signals applied to the solenoid; and

a vacuum-changeover valve in communication with said air-bleed passage between said air horn and said solenoid-operated valve, said vacuum-changeover valve being responsive to the intake manifold vacuum and controlled thereby to cut off air from said vacuum-changeover valve to said air-bleed passage during deceleration under a condition of high vacuum in the intake manifold and to introduce air from said vacuum-changeover valve into said air-bleed passage when said intake manifold vacuum is lower than a predetermined value.

4,545,351

METHOD AND APPARATUS TO CONTROL THE LEVEL OF THE AIR-TO-FUEL WEIGHT RATIO IN AN INTERNAL COMBUSTION ENGINE

Sydney P. S. Andrew, Hartlepool, England, assignor to Imperial Chemical Industries PLC, England

Continuation of Ser. No. 230,791, Feb. 2, 1981, abandoned. This application Sep. 23, 1983, Ser. No. 534,632

Claims priority, application United Kingdom, Feb. 7, 1980, 8004061

Int. Cl.⁴ F02M *7/12*

U.S. Cl. 123—440 **15 Claims**

1. A method of controlling at a level in the lean range 14.8 to 17.0 the air-to-fuel weight ratio of the mixture fed to the inlet of a gasoline fueled internal combustion engine, said method comprising the steps of:

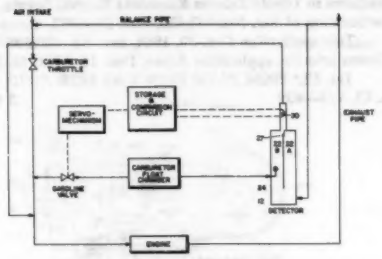
(a) taking, by means of the suction at said inlet, a sample stream of exhaust gas from said engine, said stream being

small enough not to affect significantly the composition of the engine inlet mixture;

(b) equilibrating said sample stream gas by reacting together the therein contained oxygen and any unburnt combustibles, whereby to produce an equilibrated gas containing only the oxygen in excess of the fuel in the inlet mixture fed to the engine;

(c) providing an untreated sample of said equilibrated gas and a sample treated by addition of combustible thereto;

(d) passing said untreated sample and said treated sample separately in time through a reaction zone maintained in conditions effective to cause mutual reaction of said added



combustible and said oxygen, said reaction zone containing a resistance wire acting as a catalyst and temperature sensor and said reaction taking place in the immediate vicinity of the temperature sensor;

(e) measuring electrically the temperatures attained by respectively said untreated sample and said treated sample in said reaction zone;

(f) storing and comparjng the electrical signals representing said respective temperatures to obtain a difference signal; and

(g) feeding the difference signal from said comparison to a servo mechanism actuating a gasoline feed valve in said inlet of said engine.

4,545,352

ELECTROMAGNETIC CONTROL INJECTION SYSTEMS FOR DIESEL ENGINES OF THE PRESSURE-TIME TYPE WHERE THE INJECTOR NEEDLE IS CONTROLLED BY THE CHARGING AND DISCHARGING OF A CHAMBER

Jean-Pierre Jourde, Lyons; Pedro Cmapo-Garraza, Caluire; Marc Miettaux, Decines, and Thierry Michaux, Sainte Foy les Lyon, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 21, 1984, Ser. No. 581,830

Claims priority, application France, Feb. 21, 1983, 83 02792

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—447 **4 Claims**

1. An electromagnetic fuel injection system for a diesel engine, comprising:

a fuel injector having a needle movable between an open position and a closed position for said fuel injector;

means for moving said needle from said open to said closed position, said means for moving including a piston movable with said needle and a first fluid chamber communicating with said piston such that a fluid pressure in said first fluid chamber acts to move said piston toward a first position corresponding to said closed position;

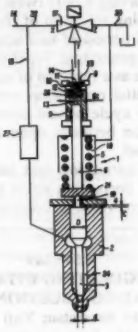
means for moving said needle from said closed position to said open position;

means for controlling a rate of movement of said needle from said closed position to said open position;

a three-way solenoid valve having a first port communicating with a source of pressurized fuel, a second port communicating with a fluid bypass and a third port, said three-way solenoid valve being positionable in a first position wherein said first and third ports are in communication, and a second position wherein said second and third ports are in communication;

first conduit means connecting said third port with said first fluid chamber, said first conduit means including means defining first and second alternate parallel fuel flow paths, said first flow path defining a restriction in comparison to said second flow path and constituting said means for controlling, said second flow path being constructed so as to be open only for flow into said first fluid chamber;

wherein said means defining first and second alternate parallel flow paths comprises:



a valve element having a pressure loss circuit therein; and

means for biasing said valve element into a position closing said first conduit means with only said pressure loss circuit communicating said first conduit means with said first fluid chamber so as to define said first flow path, wherein pressurized fuel from said three-way valve moves said valve element away from said position closing said first conduit means so as to define said second flow path,

and wherein said piston and valve element are constructed so as to minimize the volume of said first fluid chamber.

4,545,353

FUEL INJECTION SYSTEM

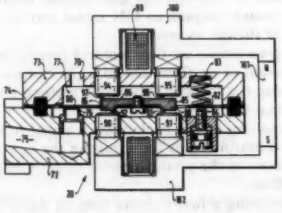
Karl Gmelin, Ingelfingen; Hans Kubach, Korntal; Wolfgang Maisch, Schwieberdingen; Klaus-Jürgen Peters, Affalterbach, and Peter Schelhas, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,110

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109560

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—454 **6 Claims**



1. A fuel system for mixture-compressing internal combustion engines with externally-supplied ignition, said system further having at least one housing and including metering valves disposed in a fuel supply line for metering a quantity of

fuel which is at a specific ratio to the quantity of air aspirated by the engine, said metering operation taking place at a pressure difference which is constant but which can be varied in accordance with operating characteristics of said engine, a regulating valve having a movable valve element disposed downstream of each said metering valve and arranged to regulate the pressure difference at the respective metering valve, said movable valve element further being capable of exposure on one side to the fuel pressure downstream of the respective metering valve and on the other side thereof to the pressure in a control pressure line defined on one end by a control pressure valve triggerable in accordance with operating characteristics of said engine and on the other end by a control throttle, characterized in that said control pressure valve has an impact plate coupled with an armature, said armature further being located within an electromagnetic field and a permanent magnetic field, said electromagnetic field and said permanent magnetic field arranged to extend partially in the same direction and partially in the opposite direction on said armature, said impact plate further arranged to cooperate with a control valve seat which communicates with said fuel supply line, said armature being disc-shaped and connected with a guide diaphragm having a torsion area, said diaphragm attached to said housing, said diaphragm further being rotatably supported about said torsion area of said guide diaphragm, and two pole shoes disposed in pairs at either side of said armature, whereby an air gap is formed between each of said pole shoes and one side of said armature, so that upon a rotation of said armature, one air gap of said pair on either side of said armature is enlarged and the other air gap is reduced in size, and that said guide diaphragm has a control area cut out from a portion of said guide diaphragm, said control area arranged to act as an impact plate and further being rotatable by said armature to a greater or lesser extent relative to said control valve seat.

4,545,354

FUEL INJECTION VALVE

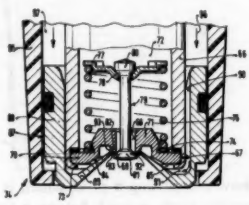
Günther Jäggle, Stuttgart, and Walter Schönemann, Waiblingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 539,851

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1982, 3240554

Int. Cl.⁴ F02M *39/00*

U.S. Cl. 123—470 **5 Claims**



1. A fuel injection valve for internal combustion engines comprising a substantially cylindrical nozzle holder having a nozzle body mounted therein, said nozzle body having a central opening provided with an injection port (at one end) a nozzle step on said injection port acting as a valve seat, a gas guidance sheath having an axially extending cylindrical portion at least partially axially containing said nozzle holder and a radially extending bottom portion at least partially covering said nozzle body, at the injection port end thereof at least one axially extending gas guidance conduit in said sheath cylindrical portion adapted to discharge gas into a gas ring conduit located between said injection port end of the nozzle body and said guidance sheath bottom portion, a throttling gas ring gap in communication with the gas ring conduit, said gas ring gap being located between the passageway opening of said sheath bottom portion and said nozzle step in the immediate vicinity of said injection port and said nozzle step arranged to protrude through said passageway opening.

4,545,355

CLOSED-LOOP MIXTURE CONTROLLED FUEL INJECTION SYSTEM

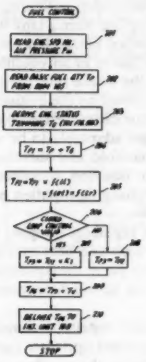
Mitsunori Takao, Kariya, and Takahiko Kimura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 27, 1984, Ser. No. 574,458

Claims priority, application Japan, Jan. 28, 1983, 58-13518

Int. Cl.⁴ F02M *51/00*

U.S. Cl. 123—489 **8 Claims**



1. A mixture control system for an internal combustion engine, comprising:

first means for detecting the pressure of air inducted to said engine;

second means for detecting the speed of said engine;

third means for detecting the concentration of a predetermined composition of exhaust emissions from said engine, said concentration varying as a function of the air-fuel ratio of a mixture supplied to said engine;

a memory having a plurality of storage locations;

control means effective to determine the optimum value of the air-fuel ratio of a mixture to be inducted to said engine, said control means including means for:

(a) deriving a basic quantity of fuel to be injected to said engine as a function of the detected pressure and engine speed,

(b) deriving a first trimming value as a function of the detected concentration,

(c) determining a second trimming value as a function of one of a plurality of ranges of different engine speed values to which the detected engine speed belongs,

(d) correcting said second trimming value dependant on said first trimming value,

(e) storing the corrected second trimming value into a storage location of said memory exclusively addressable as a function of the detected engine speed,

(f) reading the stored second trimming value as a function of the detected engine speed from said memory, and

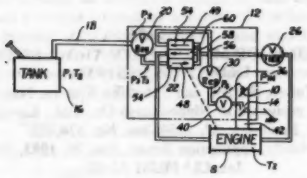
(g) trimming said basic quantity by adding thereto the read second trimming value; and

means for injecting fuel to said engine in response to the trimmed quantity.

4,545,356
LIQUIFIED PETROLEUM GAS CARBURETOR

Gary L. Casey, Troy, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed May 31, 1984, Ser. No. 615,653
Int. Cl.[4] F02B *43/00*
U.S. Cl. 123—527 **10 Claims**



1. A liquified petroleum gas carburetor for an internal combustion engine supplied from a tank with an outlet and containing source of liquified petroleum gas maintained at a pressure (P_1) wherein the gas is in an equilibrium state, and having a throttle valve in the intake tube controlling the amount of the air fuel charge ingested by the engine through the intake manifold, the carburetor characterized by:

a heat exchanger adaptable to be mounted contiguous with the intake manifold and surrounding the intake tube for receiving the liquified petroleum gas in the equilibrium state and discharging liquified petroleum gas in a vaporized state;

a first pressure regulator coupled to the outlet of the tank and integral with said heat exchanger to receive the liquified petroleum gas in the equilibrium state and regulate the pressure of the liquified petroleum gas to a second pressure (P_3);

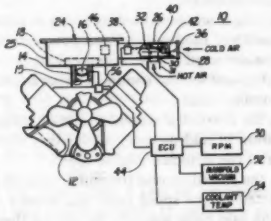
a second pressure regulatór coupled to the output of said heat exchanger and upstream therefrom, said second pressure regulator in the air flow to the throttle valve for receiving said vaporized liquified petroleum gas and regulating its pressure to a third pressure (P_4); and

a metering valve coupled to said second pressure regulator for discharging said vaporized liquified petroleum gas into the intake tube in response to engine requirements for mixing said vaporized liquified petroleum gas with the flow of air.

4,545,357
PROGRAMMABLE TEMPERATURE CONTROL SYSTEM

Walter H. Kearsley, Chatham, and David L. Wendt, Raleigh Township, Kent County, both of Canada, assignors to Canadian Fram Limited, Chatham, Canada

Filed Nov. 22, 1983, Ser. No. 554,157
Int. Cl.[4] F02M *31/00*
U.S. Cl. 123—556 **4 Claims**



1. An air temperature control system for an engine including an intake manifold, an air mixing housing in communication with said intake manifold, said housing having a first inlet adapted to receive unheated air and a second inlet adapted to receive heated air and an air mixing valve movable in relation to said first and second inlets for controlling the relative quantity of heated and unheated air available to the intake manifold, characterized in that said system further includes:

a control unit means, responsive to at least one engine operating parameter and to the temperature of the air delivered to said intake manifold for generating an actuator control signal;

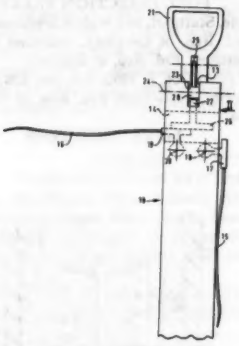
an electric linear actuator responsive to said actuator control signal and mechanically linked to said movable air mixing valve for adjusting said air mixing valve in proportion to said actuator control signal;

means for sensing the temperature of the mixed air delivered to said intake manifold wherein said sensing means is located downstream of said first and second second inlets; and wherein said control unit means includes means for temporarily removing said actuator control signal when said throttle has been moved to its wide open position and substituting therefor a second actuator control signal to close said second inlet.

4,545,358
CROSSBOW

Anthony J. Collins, Bridgnorth, England, assignor to B & P Barnett Limited, England

Filed Aug. 12, 1983, Ser. No. 522,583
Claims priority, application United Kingdom, Dec. 17, 1982, 8235967
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—88 **2 Claims**



1. A crossbow comprising a prod which is formed in two relatively movable parts, a stock having a fore-end portion, means for mounting said parts on the fore-end portion for swinging relative to the stock and relative to each other while remaining connected with the stock and a mechanism which includes:

(a) a single pressure member which acts on both of said prod parts to exert thereon force transmitted by said mechanism and

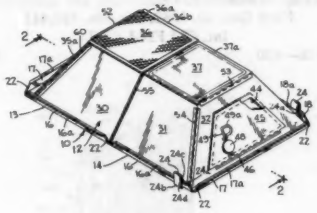
(b) a handle connected to said pressure member, said mechanism being for transmitting force with a mechanical advantage from the handle through the pressure member to the prod parts to swing the prod parts into respective positions relative to the stock, which positions are occupied when the bow is in use, and wherein the mechanical advantage provided by said mechanism increases during swinging of said prod parts of the prod into said positions.

4,545,359

OUTDOOR STOVE

Paul W. Hait, Los Gatos, Calif., assignor to Pyromid, Inc., Saratoga, Calif.

Filed Feb. 9, 1983, Ser. No. 465,307
Int. Cl.⁴ F24C *1/16*
U.S. Cl. 126—9 R **8 Claims**



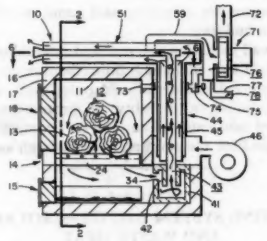
1. A stove comprising an imperforate base and a housing disposed on said base, said housing including opposing pairs of side panels, end panels and top panels; each side panel of each pair of side panels being pivoted to another side panel and to one of said end panels, and each of said top panels being pivotally connected to one of said end panels, whereby said housing can be moved to a collapsed position with each pair of pivotally-connected side panels pivoted into face-to-face contact with each other, each end plate being pivoted into face-to-face contact with one of said side panels, and each of said top panels pivoted into face-to-face contact with the end panel to which it is pivotally attached.

4,545,360

CLEAN BURNING SOLID FUEL STOVE AND METHOD

Richard D. Smith, 2415 South Court, Palo Alto, Calif. 94301, and Samuel J. Van Grouw, 1142 Blythe St., Foster City, Calif. 94404

Filed Nov. 21, 1983, Ser. No. 553,785
Int. Cl.⁴ F24B *5/04*
U.S. Cl. 126—76 **20 Claims**



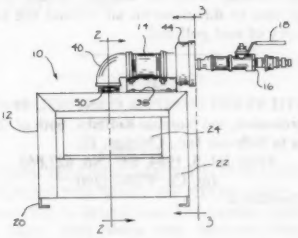
1. A solid fuel burning stove comprising:
an insulated primary combustion chamber for containing the solid fuel to be converted to combustion vapor;
a grate for supplying and for controlling the supply of atmospheric primary air and for preheating, for controlling the supply of and for delivering atmospheric secondary air to said primary combustion chamber;
an insulated secondary combustion chamber, located downstream from said primary combustion chamber, for receiving the preheated atmospheric secondary air and the combustion vapor from said primary combustion chamber, said secondary combustion chamber having at least one vortex combustor for swirling the combustion vapor with the atmospheric secondary air, for burning substantially all of the combustion vapor, for elevating the velocity of the mixture of combustion gas and secondary air, and for elevating the temperature of the mixture of combustion gas and secondary air to the highest temperature within said stove;
means for conveying the high temperature combustion gas from said secondary combustion chamber to exhaust from said stove with substantially no pollutants and at a substantially reduced temperature including
a heat exchanger located downstream from said secondary combustion chamber for receiving the high temperature combustion gas and for transferring the heat from the combustion gas to the room air; and
induced draft fan means for moving the combustion gas through said combustion chambers and said heat exchanger, and
a convective air fan to move the room air to be heated through said heat exchanger.

4,545,361

GAS HORSESHOE FORGE

Robert E. Schantz, 1226 Mead Dr., St. Louis, Mo. 63137; James D. McCune, Maryland Heights, and Pleasant A. Prunty, Hillsboro, both of Mo., assignors to Robert E. Schantz, St. Louis, Mo.

Filed Apr. 3, 1984, Ser. No. 596,259
Int. Cl.⁴ F24C *1/00*
U.S. Cl. 126—226 **7 Claims**



1. In a portable gas forge for heating horseshoes and the like in the field, said forge being comprised of a boxlike housing having an insulated interior and an opening in a front wall for insertion of the horseshoe to be heated, the improvement comprising a wind-resistant low pressure burner outlet of a burner extending into and closely received in engaging relation within an opening in a top wall of the housing, said burner having a substantially imperforate main body extending from said burner outlet within said top wall rearwardly to a gas source supply, said burner outlet terminating in an opening in an insulated portion of said top wall to provide an unobstructed interior in the housing, said gas source supply being connected to a restricted orifice supported in an enlarged annular rear primary air opening at a rear portion of the burner main body and said burner having a secondary air opening communicating directly with ambient air exteriorly of said housing and closely adjacent thereto, said primary air opening having an area substantially larger than said secondary opening.

4,545,362

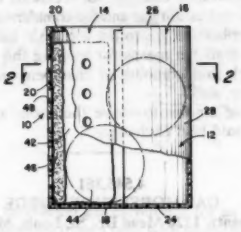
GOLF BALL HEATER

Willard E. Hendricks, P.O. Box 389, Checotah, Okla. 74426

Continuation of Ser. No. 387,498, Jun. 11, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 626,470
Int. Cl.⁴ F24J *1/00*
U.S. Cl. 126—263 **5 Claims**

1. A golf ball heater comprising:
sectional housing means having an unobstructed internal chamber therein;
a golf ball received in said housing; and
a relatively thin, flexible disposable warmer means of dimen-

sions less than the internal dimensions of said chamber, said warming means being activated by contact with air to generate heat, said flexible warming means being disposed within the internal chamber, the chamber having an internal diameter slightly larger than said golf ball and being configured to conform to and engage at least a portion of the inner periphery of the housing and surrounding and



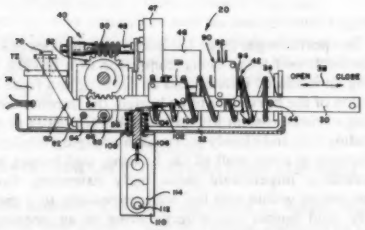
contacting at least a portion of said golf ball loosely disposed within the chamber, said housing being provided with aperture means in the proximity of the warmer means for providing communication between the exterior of the housing and the internal chamber for transmitting external air into contact with the warmer means for actuation thereof and to direct warm air around the entire outer periphery of said golf ball.

4,545,363

VENTILATION DAMPER CONTROL SYSTEM

Shlomo Barchechat, and Norman Kolitsky, both of Chicago, Ill., assignors to Safe-Air Inc., Chicago, Ill.

Filed Jul. 5, 1984, Ser. No. 627,840
Int. Cl.[4] F23L *3/00*
U.S. Cl. 126—285 B **18 Claims**



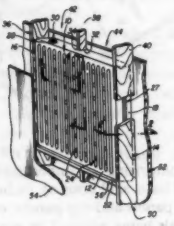
1. A control system for controlling movement of damper blades in a damper housing between open and closed positions comprising support means having a driving link movable thereon and connectable to said blades for moving said blades between open and closed positions, biasing means between said support means and said driving link for biasing said link to a position corresponding to said closed position, drive means cooperating with said driving link for moving said driving link, engaging means on said support means producing engagement between said drive means and said driving link so that energization of said drive means will move said link from said position corresponding to said closed position to a position corresponding to said open position, and latch means cooperating with said engaging means normally maintaining engagement between said driving link and drive means to hold said driving link in said position corresponding to said open position, said latch means being responsive to preselected conditions to release said engaging means and allow said biasing means to move said driving link to said closed position; said latch means including a magnetic member with a power source and circuit means connecting said power source to said magnetic member, and switch means in said circuit means actuatable to separate said power source from said magnetic member.

4,545,364

SOLAR HEATING MODULE

Timothy J. Maloney, Mountain Falls, Va., assignor to One Design, Inc., Winchester, Va.

Filed Dec. 20, 1982, Ser. No. 451,411
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—430 **21 Claims**



1. A combination solar collector, thermal storage and heating module for mounting in a building framework, comprising:
- a hollow panel member for receiving a thermal storage mass, including an outer wall and an inner wall;
- wall joining means for connecting the corresponding perimeters of said inner and outer walls, thereby defining an enclosed chamber, said panel member being sized for insertion between adjacent studs of a building;
- tensile means between said inner and outer walls for maintaining the rigidity of said walls when said chamber is filled with said mass;
- said tensile means including a plurality of individual connections, each defining mutually opposed pairs of depressions in said walls, the opposed pairs being connected and each said connection has a generally circular cross section through the length thereof;
- port means into said panel member, for filling said panel member with said mass; and
- mounting means for attaching said panel member into the frame of a building;
- said outer wall including external and internal surfaces, and said module also including anti-reflective coating means on the external surface of said outer wall, said coating means including a plurality of protrusions integrally molded on said external surface for increasing solar absorption and for transmitting light through said module.

4,545,365

FLUID HEATING SYSTEM UTILIZING SOLAR ENERGY AND WASTE HEAT

Otto K. Wetzel, Jr., Dallas, Tex., assignor to Wetzel Enterprises, Inc., Dallas, Tex.

Filed Dec. 7, 1983, Ser. No. 558,934
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—433 **3 Claims**

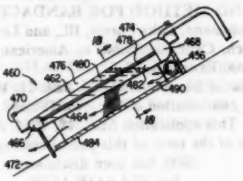
1. For use in conjunction with a source of waste heat, a thermal collector comprising:
- an enclosure including first and second plates each formed from a thermally conductive material, said enclosure having a refrigerant receiving zone and a refrigerant vapor discharge zone;
- liquid conduit means having a first portion for delivering refrigerant to said refrigerant receiving zone, and a second portion for delivering a vapor component of said refrigerant from said collector;
- a third plate formed from a thermally insulating material and being positioned within the enclosure between the first

and second plates to divide the enclosure into first and second refrigerant paths, said first refrigerant path located between said first and third plates and said second refrigerant path located between said second and third plates;

said refrigerant being normally supported in both said first and second refrigerant paths, with said third plate being normally partially submerged in said refrigerant receiving zone;

means supporting the enclosure with the first plate positioned for contact by sunlight so that the refrigerant within the first refrigerant path is heated primarily by solar energy; and

means for directing a waste heat-laden fluid from the waste heat source into engagement with the second plate so that the refrigerant within the second refrigerant path is heated primarily by said waste heat-laden fluid, said third plate serving to prevent heat dissipation from said second refrigerant path when solar energy is not being received by said collector.

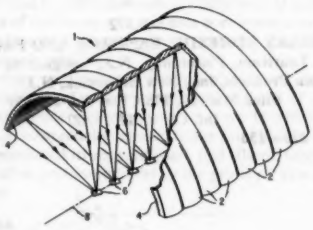


4,545,366

BI-FOCUSSED SOLAR ENERGY CONCENTRATOR

Mark J. O'Neill, Richardson, Tex., assignor to Entech, Inc., Tex.

Filed Sep. 24, 1984, Ser. No. 653,147
Int. Cl.⁴ F24J 3/02
U.S. Cl. 126—440 **18 Claims**



1. A lens system for focussing radiant energy on an energy receiving means arranged along a longitudinal axis, said lens system comprising:

first concentrator means comprising a plurality of cylindrical lens elements mounted adjacent to each other in a direction perpendicular to the longitudinal axis of said energy receiving means, said elements serving to receive incident radiant energy and initially focussing the incident energy in a first manner; and

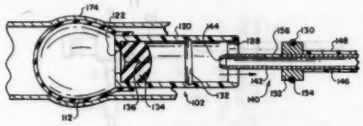
second concentrator means comprising a Fresnel lens optically coupled to said plurality of cylindrical lens elements and being operable to re-focus said initially focussed radiant energy to form discrete focal spots on the energy receiving means.

4,545,367

DETACHABLE BALLOON CATHETER AND METHOD OF USE

Charles A. Tucci, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 399,142, Jul. 16, 1982, abandoned. This application Nov. 18, 1983, Ser. No. 553,147
Int. Cl.⁴ A61M 29/02
U.S. Cl. 128—1 R **29 Claims**



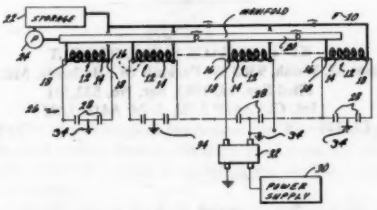
3. A detachable balloon catheter assembly comprising a rigid cylinder having a distal end and a proximal end, a balloon having an open end coupled to said distal end of said rigid cylinder, a valve assembly in said rigid cylinder, a catheter, detachable fluid coupling means including a filling tube connected to said catheter and a piston on said filling tube in said rigid cylinder, said filling tube being initially coupled to said valve assembly within said rigid cylinder, and means for quickly detaching said fluid coupling means from said valve means and said rigid cylinder.

4,545,368

INDUCTION HEATING METHOD FOR USE IN CAUSING NECROSIS OF NEOPLASM

Robert W. Rand, 521 N. Bristol Ave., Los Angeles, Calif. 90049; Harold D. Snow, 4201 Noble Ave., Sherman Oaks, Calif. 91403; David G. Elliott, 737 W. Starlight Heights, La Canada, Calif. 91011, and Glenn M. Haskins, 3811 Rio Hondo Ave., Rosemead, Calif. 91770

Filed Apr. 13, 1983, Ser. No. 484,491
Int. Cl.⁴ A61K 9/14
U.S. Cl. 128—1.3 **16 Claims**



1. A process of causing necrosis of neoplasm as a result of hyperthermia of the neoplasm in which particles capable of exhibiting hysteresis heating are injected into tissue in proximity with the neoplasm and are subjected to an alternating magnetic field so as to cause hysteresis heating of said particles in which the improvement comprises:

said particles are mixed with a carrier fluid as they are injected into said tissue,

said carrier fluid being biologically inert and being capable of becoming a solid or semi-solid within said tissue, and

causing said carrier fluid to become said solid or semi-solid within said tissue.

4,545,369

WATERPROOF ENDOSCOPE

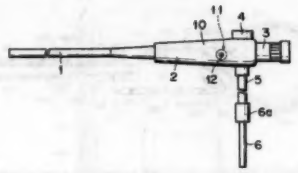
Mitsuru Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Machida Seisakusho, Japan

Filed Apr. 30, 1984, Ser. No. 605,620

Claims priority, application Japan, May 18, 1983, 58-73070[U]

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—4 8 Claims



1. A waterproof endoscope comprises:

(a) a insertion tube having one end adapted to be inserted into a hollow organ of a subject;

(b) control means connected to said insertion tube for controlling the operation of said insertion tube;

(c) a hollow housing connected to said insertion tube in an air-tight manner and disposed in communication therewith, said housing having an aperture formed therethrough;

(d) a guide tube connected to said control means at one end thereof;

(e) a plug member connected to the other end of said guide tube, said plug member being connectable to a source of light;

(f) an ocular tube connected to said insertion tube;

(g) first optical means extending through said insertion tube, said hollow housing and said guide tube, said first optical means being connected to said plug member for supplying light to said one end of said insertion tube;

(h) second optical means extending from said one end of said insertion tube to said ocular tube; and

(i) valve means mounted on said housing, said valve means including a valve element for normally closing said aperture of said housing, and a spring made of a marmen alloy which is returned to a preselected shape at a predetermined temperature so as to urge said valve element away from said aperture, thereby opening said valve means.

4,545,370

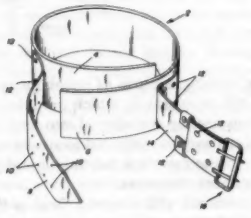
KINETIC BACK SUPPORT BELT

Thomas M. Welsh, 9303 W. Parkhill Dr., Bethesda, Md. 20814

Filed Sep. 14, 1983, Ser. No. 532,221

Int. Cl.[4] A61F *5/02, 5/24;* A41F *3/02*

U.S. Cl. 128—78 21 Claims



1. A back support belt, comprising:

an elongate support band which is 3½ to 6 inches wide along the entire length thereof having a first and second longitudinal end, said support band being formed of leather which is 4 to 8 mm thick or being formed of a relatively rigid material having a similar stiffness as said leather; and

tightening means for tightening said belt around a subject in a position wherein said first and second longitudinal ends of said support band overlap between 6 to 10 inches and said tightening means applys external pressure to both of said overlapping longitudinal ends of said belt when tightened.

4,545,371

SYSTEM AND METHOD FOR BANDAGING A PATIENT

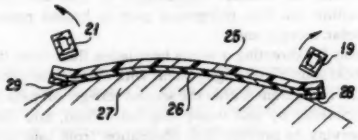
Frederic Grossmann, Lake Forest, Ill., and Larry A. Sims, Hermosa Beach, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 460,086, Jan. 21, 1983, abandoned, which is a continuation of Ser. No. 186,352, Sep. 11, 1980, abandoned. This application Mar. 19, 1984, Ser. No. 589,867

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—132 D 7 Claims



1. In a system for bandaging a patient, said system comprising a flexible, rectangular bandage having a transparent backing with an adhesive on one surface for applying to a patient, and a removable liner protecting the adhesive prior to use; said bandage being permeable to water vapor, but impermeable to liquid water and bacteria; wherein the improvement comprises:

a first and second handle being substantially less flexible than said bandage, and attached to said bandage such that the handles maintain said bandage in a generally flat configuration and control wrinkling during handling and application of the bandage to the patient; said bandage and handles being in a sterility protecting package.

4,545,372

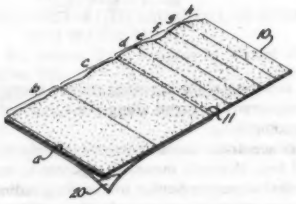
UNITARY ADHESIVE BANDAGE AND PACKAGE

Nels J. Lauritzen, Piscataway, N.J., assignor to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Mar. 28, 1983, Ser. No. 479,599

Int. Cl.[4] A61F *15/00*

U.S. Cl. 128—156 13 Claims



1. An elongated adhesive strip bandage with integral wrapper constructed of a single length of bulky heat fusible nonwoven fabric, said wrapper additionally being provided with an adhesive release surface over at least a portion thereof,

said bandage having a bulky central pad and a pair of oppositely disposed heat-compacted wing areas extending from said pad and coated with a pressure sensitive adhesive,

a length of heat-compacted nonwoven material having substantially the same width as said bandage and at least twice the length thereof extending from the end of one of said adhsive coated wing areas to form the wrapper for said bandage,

said wrapper being folded around said bandage in a lengthwise direction and the free end and both side edges of said wrapper being heat sealed to enclose said bandage,

said wrapper having an adhesive release surface over at least the portion thereof in contact with the adhesive coated of the enclosed bandage.

4,545,373

SILASTIC TUBE RELAY ROD

George C. Christoudias, 331 River Rd., New Milford, N.J. 07646

Filed May 4, 1983, Ser. No. 491,587
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R 10 Claims

1. An instrument for performing a subcutaneous shunt for carrying a silastic tube or vascular graft between incisions in two parts of a body, which comprises in combination:

a relay rod of rigid non-toxic material comprising head, shaft and handle portions;

said head portion having a receptor bore extending therethrough adjacent the unindented tip portion at the proximal end in a direction substantially normal to the principal axis of said head, said receptor bore constructed to accommodate said silastic tube or vascular graft in threaded-through relation;

said relay rod having a portion of reduced circumference distal to said receptor bore, said portion of reduced circumference including one or more longitudinal depressions substantially parallel to the principal axis of said rod, constructed to accommodate said silastic tube or vascular graft in position parallel to the principal axis of said relay rod.

4,545,374

METHOD AND INSTRUMENTS FOR PERFORMING A PERCUTANEOUS LUMBAR DISKECTOMY

Robert E. Jacobson, 1295 NW. 14th St., Suite G, Miami, Fla. 33125

Filed Sep. 3, 1982, Ser. No. 414,779
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R 32 Claims

32. An apparatus for percutaneously accessing a patient's internal body tissue comprising:

(a) a speculum having blades for creating a percutaneous body channel;

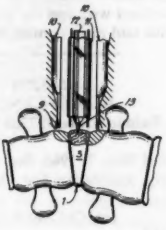
(b) a cannula for insertion into the percutaneous body channel between the speculum blades, the cannula having:

(i) a tubular member having a lumen for passage of medical instruments therethrough, and

(ii) anchor means for anchoring the cannula in tissue, thereby preventing shearing movement between the member and the tissue; and

(c) a trocar for insertion of the cannula between the speculum blades, the trocar being slidably inserted into the cannula, the trocar having:

(i) a shaft having a tapered operating end for insertion into the percutaneous channel; and



(ii) a tip on the tapered operating end for anchoring the trocar in body tissue; wherein:

(d) the cannula member has an oval cross section and aperatures for reception of the anchor means;

(e) the cannula anchor means is one or more anchor wires for slidable insertion into the member apertures; and

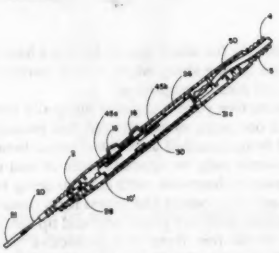
(f) the trocar has an adjustable collar for establishing the length that the trocar is slidably inserted into the cannula.

4,545,375

ELECTROSURGICAL INSTRUMENT

Albert L. Cline, Littleton, Colo., assignor to Aspen Laboratories, Inc., Englewood, Colo.

Filed Jun. 10, 1983, Ser. No. 503,110
Int. Cl.[4] A61B *17/39*
U.S. Cl. 128—303.14 15 Claims



1. An electrosurgical instrument for selectively providing electrical energy from an electrosurgical generator to an electrode blade for cutting, coagulation and the like comprising:

a housing;

a selector means movably mounted relative to the housing;

an inner insulated, elongated core member disposed within the housing, having a first end, a second end and an intermediate portion therebetween;

a main electrical contact wire embedded within and extending throughout said inner core member and extending distally out of said first end and proximally out of said second end, said intermediate portion of said inner core member including at least one window exposing the main contact wire;

a means for connecting the proximally extending portion of said main contact wire to electrical energy;

an electrode blade in electrical contact with said distally extending portion of the main contact wire, said blade extending outwardly from the housing;

at least one electrical contact switch mounted on the intermediate portion of said inner core member; and,

a means for connecting said at least one switch to electrical energy, said at least one switch extending between said selector means and said at least one window and spaced apart from said window, said selector means operatively moving the at least one electrical contact switch as desired by an operator, to electrically contact the main contact wire exposed through said at least one window, effecting an electrical interconnection between the electrode blade, the main contact wire and the contact switch in electrical contact with said main contact wire.

4,545,376

BLOOD LANCET

Werner Beiter, Daimlerstrabe 8, 7735 Dauchingen, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,669

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208391

Int. Cl.⁴ A61B *5/14*

U.S. Cl. 128—314 **10 Claims**

1. A relatively flat blood lancet, having a handle portion and a tip portion having sharp edges, which portions are made of plastic in one piece, comprising:

a flat protective yoke-like guard integrally formed as a part of said one piece of plastic, and said protective yoke-like guard being attached at two weakened breakoff points to said handle only on opposite sides of said tip but free of any contact therewith, with said tip being received unobstructedly in a cutout-like recess form transversely of said protective yoke-like guard; and said tip being spaced away so as to be free from said protective yoke-like guard, thereby leaving the sharp edges of said tip free and clear of any plastic material, and said two weakened breakoff attachment points of said protective yoke-like guard adapted to be broken off by bending said protective yoke-like guard in a direction perpendicular to a plane passing through said blood lancet.

4,545,377

NON-METALLIC, BIO-COMPATIBLE HEMOSTATIC CLIPS (TWO PIECE CONFIGURED TO LOCK TIGHTER THE LARGER THE VESSEL BEING CLOSED)

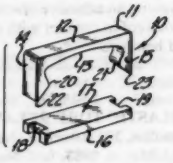
Robert J. Cerwin, Pittstown, and John S. Pedlick, Butler, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 422,981, Sep. 24, 1982, abandoned. This application May 24, 1984, Ser. No. 613,693

Int. Cl.⁴ A61B *17/12, 17/00*

U.S. Cl. 128—325 **2 Claims**

1. A sterile, two-piece hemostatic clip for occluding vessels, said clip comprising a first piece having a spanning member with a vessel clamping surface, a leg member disposed at each end of said spanning member from the same side as said vessel clamping surface, each of said leg members comprising a U-shaped member with the inner facing surfaces of the legs of the U being beveled from their free ends towards the base of the U, said beveled surfaces terminating above the base of the U to form locking ears, said first piece being adapted to be placed on



the vessel to be occluded by placing the associated U-shaped legs on opposite sides of the vessel and the vessel clamping inner surface in contact with said vessel and a straight second piece having a vessel clamping surface, said second piece being sized and configured to extend between and fit within each of said U-shaped members and be held in place by said ears.

4,545,378

BABY PACIFIER

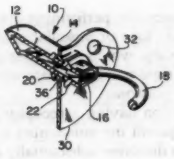
Anthony Chrones, Warwick, R.I., assignor to Gerber Products Company, Fremont, Mich.

Filed Mar. 12, 1979, Ser. No. 19,460

The portion of the term of this patent subsequent to Jun. 8, 2001, has been disclaimed.

Int. Cl.⁴ A61J *17/00*

U.S. Cl. 128—360 **1 Claim**



1. In a baby pacifier, the combination of:

a soft, resilient, one-piece hollow shank having two ends, one of said ends forming a hollow baglet, the other of said ends extending into a handle, and between said ends having a symmetrical pair of spaced collars the mutually facing sides of which are perpendicular to said shank and define an annular locking groove, the non-facing sides of which are tapered down to said shank; and

a rigid planar shield having an opening surrounded on both sides by flat thickened areas to form an annular tongue complementary to said groove

whereby forcing the portion of said shank comprising said baglet and one of said collars through said opening locks said tongue in said groove.

4,545,379

BODY COOLING DEVICE

John F. Jenkins, 103 S. Franklin Ave., Pleasantville, Pa. 08232

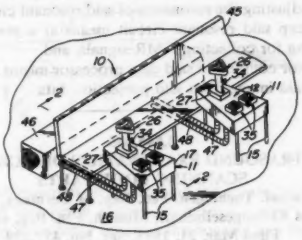
Filed Feb. 13, 1984, Ser. No. 579,379

Int. Cl.⁴ A61F *7/00*

U.S. Cl. 128—399 **6 Claims**

1. A body cooling device comprising an elongated insulated enclosure having a hollow chamber for communcation with a source of conditioned air, an upwardly openable first outlet connected to and upstanding from an upper region of said enclosure adjacent to one enclosure end for passing condi-

tioned air exteriorly of the chamber to a user's face, said first outlet including means adapted to position a user's face therein, said first outlet further including means adapted to be selectively positionable for passing air in a desired direction, a pair



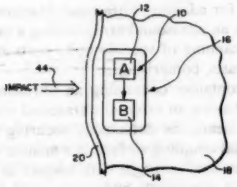
of additional upwardly opening outlets connected in an upper region of said enclosure adjacent to the other enclosure end for passng conditioned air exteriorly of the chamber to a user's hands, and valve means associated with said hand outlets for selectively opening and closing the latter.

4,545,380

METHOD AND APPARATUS FOR SETTING AND CHANGING PARAMETERS OR FUNCTIONS OF AN IMPLANTED DEVICE

Edward A. Schroeppel, Miramar, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Apr. 16, 1984, Ser. No. 601,807
Int. Cl.[4] A61N *1/08*
U.S. Cl. 128—419 P **20 Claims**



1. A method for setting and adjusting parameters or functions of an implanted device utilizing a piezoelectric sensor implanted in the user's body, comprising the steps of:

a. causing a physical impact on the user's body adjacent the sensor;

b. piezoelectrically converting the impact into an appropriate electrical signal; and

c. utilizing the electrical signal for setting and/or adjusting parameters or functions of the implanted device,

whereby the parameters or functions can be set or adjusted at will by simply causing a physical impact on the user's body adjacent the sensor.

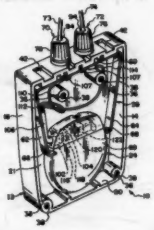
4,545,381

ADAPTER FOR CONVERTING A METAL ENCAPSULATED IMPLANTABLE CARDIAC PACER TO AN EXTERNALLY WORN CARDIAC PACER

Frederick M. Bournay, Jr., Evansville, Ind., and Joel F. Giurtino, Miami, Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Oct. 1, 1984, Ser. No. 656,696
Int. Cl.[4] A61N *1/00*
U.S. Cl. 128—419 P **22 Claims**

1. An adapter for converting a metal encapsulated implantable device, such as a cardiac pacer, to an externally worn device, said adapter comprising: a non-conductive housing; means for securing said device within said housing, said means for securing said device within said housing being in direct electrical contact with a metal housing of the device; and



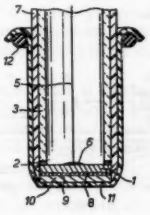
electrical interfacing means for securing a conductive lead assembly to said housing in an electrically conductive manner and means within said housing for electrically connecting said lead assembly to said device within said housing in an electrically conductive manner.

4,545,382

SENSOR FOR COMPONENTS OF A LIQUID MIXTURE

Irving J. Higgins, Wilden; Hugh A. O. Hill, Oxford, and Elliot V. Plotkin, Bedford, all of England, assignors to Genetics International, Inc., Cambridge, Mass.

Filed Oct. 22, 1982, Ser. No. 436,106
Claims priority, application United Kingdom, Oct. 23, 1981, 8132034
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—635 **19 Claims**



1. A sensor electrode for use in a liquid mixture of components, said electrode being responsive to the presence of at least one selected component of said mixture capable of undergoing an enzyme-catalysed reaction, the electrode being composed of electrically conductive material and comprising, at least at an external surface thereof, the combination of an enzyme and a mediator comprising a ferrocene which transfer electrons between the enzyme and the conductive material of the electrode when the enzyme is catalytically active to provide a current representative of said activity.

4,545,383

ANTENNA STRUCTURE FOR COLLECTION AND DETECTION OF RADIATION

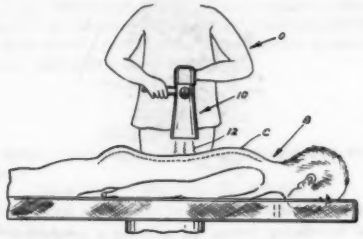
Irwing N. Toftness, Cumberland, Wis., assignor to Toftness Post-Graduate School of Chiropratic Inc., Cumberland, Wis.

Filed May 23, 1983, Ser. No. 496,932
Int. Cl.[4] A61B *6/00*
U.S. Cl. 128—653 **13 Claims**

1. A hand held mechanical antenna structure collecting radiation for detection, having in combination

an elongated housing having open upper and lower ends,

a cone shaped antenna member disposed within said housing,
an outlet of relatively small width at one end of said antenna member,
a sensing plate member carried by said housing spaced above said outlet,
a shutter member in operative association with said outlet,



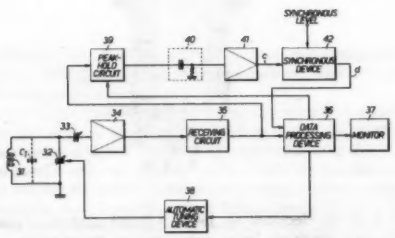
means carried by said housing for moving said shutter member relative to said outlet,
a hood member upstanding from the upper end of said housing overlying said sensing plate member, and
an opening in said hood member providing access to said sensing plate member.

4,545,384

NUCLEAR MAGNETIC RESONANCE DIAGNOSTIC APPARATUS

Tatsuhiko Kawachi, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 23, 1984, Ser. No. 582,701
Claims priority, application Japan, Feb. 23, 1983, 58-28701
Int. Cl.⁴ A61B *5/05*
U.S. Cl. 128—653 **5 Claims**



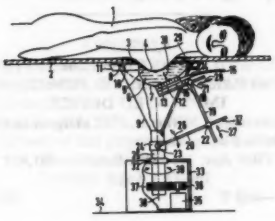
1. A nuclear magnetic resonance (NMR) diagnostic apparatus for forming an image of a slice of an object, said apparatus including means for inducing NMR signals in the object, comprising:
receiving means including resonant circuit means responsive to NMR signals for producing output signals;
data processor means coupled to said receiving means for (1) digitizing the output signals to digital data, (2) Fourier transforming the digital data into projecting data, (3) storing said projection data, (4) generating signals indicative of time periods, and (5) generating control signals in response to the receipt of a synchronous signal;
peak-hold means coupled to said receiving means and responsive to said time period signals for holding a maximum value from a set of output signals received during each of said time period;
synchronous means coupled to said peak-hold means for comparing said maximum value outputted from said peak-hold means with a reference level, and outputting a synchronous signal to said data processor in response to said maximum value being greater than said reference level to produce a control signal;
automatic tuning means coupled to said data processor means and to said resonant circuit means responsive to the receipt of a control signal from the data processor means, for adjusting the resonance of said resonant circuit means, to keep said resonant circuit means at a predetermined setting for collecting NMR signals; and
a monitor coupled to said data processor means for displaying said image from said projection data.

4,545,385

ULTRASOUND EXAMINATION DEVICE FOR SCANNING BODY PARTS

Joerg Pirschel, Tuebingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,039
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1982, 3210610; Jan. 24, 1983, 3302254
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—660 **30 Claims**



1. A device for adapting ultrasound examination apparatus which includes an ultrasound array having a radiation surface to dedicated scanning of specific body parts such as testicles and female breasts, comprising:
(a) a fluid container containing an ultrasound conducting fluid and having an external ultrasound coupling surface;
(b) support means for detachably securing the ultrasound array to said coupling surface in a manner that said radiation surface is at an angle with respect to a substantially vertical axis of rotation; and
(c) rotation means for rotating said support means and said ultrasound array around said axis of rotation, whereby said radiation surface rotates on a conical path around the body part to be scanned and said body part is scanned from a plurality of directions.

4,545,386

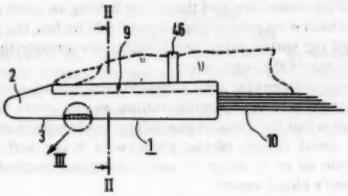
MANUALLY OPERATED ULTRASOUND APPLICATION

Walter Hetz, Erlangen, and Peter Weber, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens AG, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,784
Claims priority, application Fed. Rep. of Germany, May 21, 1982, 3219271
Int. Cl.⁴ A61B *10/00*
U.S. Cl. 128—660 **1 Claim**

1. A manually operated ultrasound applicator for use in body cavities, said ultrasound applicator comprising:
(a) an ultrasound array containing a plurality of ultrasound transducer elements;
(b) an elongated housing containing said ultrasound array, said housing having a scanning surface for placement on an area under examination and a concave and elongated top surface opposed to said scanning surface and shaped to accommodate a bottom surface of a user's fingertip;
(c) a connection cable electrically connected to said ultra-

sound array and adapted for coupling to an image signal processing device; and



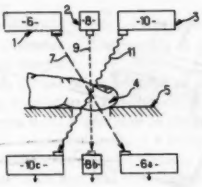
(d) a yoke mounted on the housing and located above its top surface and being shaped to receive a user's fingertip, thereby detachably securing the housing to a distal end of a user's fingertip.

4,545,387

APPARATUS FOR RECORDING, CONTROL AND EARLY DETECTION OF CARDIOVASCULAR DISEASES

Georges A. Balique, Evasion 2000, 22 rue Emeriau, Paris, France

Continuation-in-part of Ser. No. 170,574, Jul. 21, 1980, abandoned. This application Nov. 26, 1982, Ser. No. 444,379
Claims priority, application France, Jul. 24, 1979, 79 19061
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—687 **10 Claims**



1. Apparatus for recording, controlling and early detecting of cardiovascular diseases by detection, recording, and visual and audible display of the heart beat frequency and rhythm from a digital pulse recording picked up by a plethysmographic process at a finger of a hand of a person, said apparatus comprising

at least two different transducer devices of different types, each in operative proximity around said finger and each having a generator for providing a signal of a determined frequency and an associated sensor for sensing signals from said generator, said sensor providing an output signal modulated in amplitude by expansion of the blood vessel walls in said finger;

a multiplexing unit connected to said transducer devices and processing output signals from said sensors of said transducer devices to select signals from said transducer devices which are representative of information about the heart beat frequency and rhythm;

at least one correlating circuit connected between the output of said transducer devices and said multiplexing unit for predetermining the oncome of a pulse from one of said transducer devices in accordance with at least one of the pulses already detected by another of said transducer devices; and

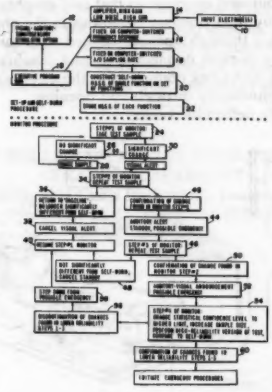
display means connected to said multiplexing unit for visually and audibly displaying said information and recording said information so that said information is always representative of the regularity of the heart beat frequency and rhythm when the latter is regular or of the irregularity of the heart beat frequency and rhythm when the latter is irregular.

4,545,388

SELF-NORMED BRAIN STATE MONITORING

E. Roy John, 265 S. Barry Ave., Mamaroneck, N.Y. 10543

Filed Jun. 9, 1983, Ser. No. 502,568
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—731 **2 Claims**



1. A machine-implemented method for monitoring the occurrence and ascribed medical significance of changes in a patient undergoing a medical procedure relative to a prior state of the patient at a time selected for medical relevance to the planned procedure after administration of anesthesia, comprising:

electrically measuring brain functions of the patient which are selected for medical relevance to a medical procedure which the patient is to undergo, at said time at which the patient is in a state selected for medical relevance to the procedure, said selected state being after administration of anesthesia;

processing the measurements to produce a self-norm comprising, for each brain function, a respective statistically and medically significant mean measurement and a respective statistically and medically significant standard deviation or variance measurement;

electrically measuring the same brain functions of the same patient during the said procedure, at each of a sequence of time intervals selected for medical relevance to the procedure;

testing each new set of measurements for statistically and medically significant change from the self-norm;

converting each significant change to a dimensionless probability of significant deviation and combining at least two of the said probabilities through vector addition into a single vector-form indication of said medically significant change; and

producing a tangible indication of the vector-form indication of the significant change, said tangible indication conveying information both as to the occurrence of a change and as to the ascribed medical significance of the change itself and the persistence of the change.

4,545,389

DISPOSABLE PHYSIOLOGICAL PRESSURE SENSING SYSTEM

Richard R. Schaberg, and James E. Cole, both of Ventura, Calif., assignors to Gould Inc., Rolling Meadows, Ill.

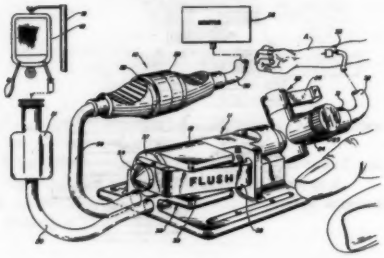
Filed Jul. 14, 1982, Ser. No. 398,399
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—748 **16 Claims**

1. A physiological pressure monitoring apparatus having a

housing defining a fluid chamber and a wall portion provided with an aperture opening to said fluid chamber, and pressure transducer means mounted in said housing and responsive to fluid pressure in said fluid chamber for providing a corresponding electrical output signal, said pressure transducer means comprising:

a force collector comprising a compliant diaphragm, means sealingly bonding said diaphragm to said housing well portion about said aperture so that said diaphragm will be deflected by fluid pressure variations in the chamber, a frame defining a through opening aligned with said aperture and having a portion connected to said diaphragm about said opening, and a link connected to the diaphragm and extending longitudinally through said opening;

a resiliently deflectible beam;



strain gage means carried by the beam for providing an electrical signal corresponding to the amount of deflection of the beam;

isolator means mounting a first portion of the beam to the frame with a second portion of the beam juxtaposed to said link;

means securing said second portion of the beam to said link for movement with said link as an incident of deflection of said diaphragm and causing said strain gage means to produce an electrical signal corresponding to the amount of deflection of said beam produced by said movement; and

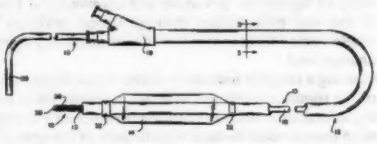
electrical conductor means connected to said strain gage means for electrically connecting said strain gage means to monitoring apparatus externally of said housing.

4,545,390

STEERABLE GUIDE WIRE FOR BALLOON DILATATION PROCEDURE

James J. Leary, Woburn, Mass., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Sep. 22, 1982, Ser. No. 421,315
Int. Cl.[4] A61M *25/00*
U.S. Cl. 128—772 **70 Claims**



1. A steerable small diameter guide wire comprising:

a main wire having a tapered distal region;

a helically wound spring at the distal region of the main wire, the tapered region of the main wire being received within the spring, the proximal end of the spring being secured to the main wire at a proximal connection adjacent to the region where the main wire begins to taper;

the distal end of the main wire terminating short of the distal end of the spring and being secured to the spring at a distal connection;

the spring having a relatively short portion which extends distally beyond the distal end of the main wire, the distally extending short portion being highly flexible and terminating in a smoothly surfaced rounded tip;

each of the main wire and the spring having an outer diameter which is no greater than about 0.020 inches, the diameter of the spring being not substantially greater than the diameter of the main wire;

the guide wire having a distal region which is adapted to be bent to a set curved configuration and to retain that set curve when the distal region of the guide wire is relaxed, said distal region of the guide wire being sufficiently flexible so as to adapt to and follow the contours of a patient's blood vessel;

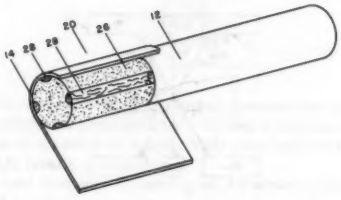
said guide wire having means sufficiently torsionally rigid along its length for transmitting to the distal end of the guide wire substantially all of the angular rotation applied to the proximal end of the guide wire thereby enabling the curved distal end of the guide wire to be controllably directed to selected branches of a patient's vascular system.

4,545,391

CIGARETTE FILTER

Robert R. Johnson, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed May 26, 1983, Ser. No. 497,970
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—336 **7 Claims**



1. A filter for a cigarette comprising:

a substantially smoke impermeable core member of generally cylindrical configuration;

strips of smoke permeable material overlaying selected portions of the periphery of said impermeable core member extending generally longitudinally of said core member; and,

tipping material extending longitudinally of and circumscribing said smoke impermeable core and said smoke permeable material, said tipping material being pervious to air over at least a portion of said smoke permeable material.

4,545,392

TOBACCO PRODUCT

Andrew J. Sensabaugh, Jr.; Dewitt C. Crepps; William Y. Rice, Jr., all of Winston-Salem, and George W. Fearrington, Jr., Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Co., Winston-Salem, N.C.

Filed Jul. 25, 1983, Ser. No. 516,995
Int. Cl.[4] A24B *15/18, 15/28*
U.S. Cl. 131—352 **27 Claims**

1. A smokeless tobacco product comprising pieces of cut or otherwise comminuted tobacco and a gum composition adhering as a discontinuous coating to the surface of a substantial proportion of said pieces of cut or otherwise comminuted tobacco and wherein the quantity of said gum composition present in said product is sufficient to provide between 1 and 35 parts by weight of a non-saccharide, water-insoluble gum

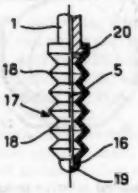
base component per 100 parts by weight of dry tobacco contained in said product.

4,545,393

MAKE-UP BRUSH

Jean-Louis H. Gueret, and Jean-Pierre Arraudeau, both of Paris, France, assignors to L'Oreal, Paris, France

Division of Ser. No. 380,904, May 21, 1982, abandoned. This application Nov. 29, 1983, Ser. No. 556,111
Claims priority, application France, May 27, 1981, 81 10586
Int. Cl.⁴ A45D *40/30*
U.S. Cl. 132—88.5 **2 Claims**



1. In a make-up brush having longitudinal axis and comprising:

(a) shaft means; and

(b) brush means having first and second ends and including means regularly distributed around said longitudinal axis of the brush to serve as applicators; the improvement comprising

(c) means actuable by a user of a make-up brush for varying the brush diameter at least locally at said regularly distributed means thereof;

(d) said brush means being adapted to undergo deformation to varying lengths so as to produce an increase in diameter simultaneous with a decrease in length and vice versa;

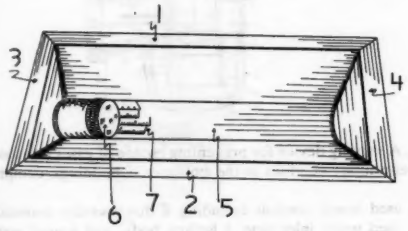
(e) said brush means comprising a bellows forming deformable fins constituting said regularly distributed means in the form of teeth, and said teeth being arranged to increase in diameter when the bellows decreases in length.

4,545,394

COIN COUNTER TROUGH

Chen-Kun J. Chang, 215 Powell St., San Francisco, Calif. 94102

Filed Sep. 30, 1983, Ser. No. 537,573
Int. Cl.⁴ G07D *9/02*
U.S. Cl. 133—8 R **1 Claim**



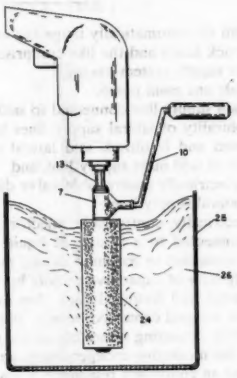
1. A coin counter, comprising an elongate body having a groove therein, said groove having both ends closed and having a curved surface with a radius of curvature slightly greater than the radius of curvature of the largest coin among a predetermined set of different denominations of coins to be counted, and an elongate trough with high inclining sides attached to and extending upwardly and outwardly from the top of said grooved body, the depth of said groove when combined with said trough being more than 125% of the diameter of said largest coin, the width of the top of said trough being more than 1.5 times the diameter of said largest coin, said trough communicating with the sides of said groove for collecting and directing coins into said groove when they are loosely deposited into said trough, whereby said grooved body will enable loosely-deposited coins to be easily shaken to lie flat and be rearranged manually by rotation, if in an improper position, and by pushing, into vertical positions in a horizontal stack aligned with and at the bottom of said groove, said grooved body being provided with a plurality of numbered scales at convenient positions for counting coins of various denominations when said stack extends from one end of said groove.

4,545,395

PAINT ROLLER APPARATUS WITH INHERENT CLEANING CAPABILITY

William F. Kolb, 2844 Castle Harbour Pl., Ontario, Calif. 91761

Filed Nov. 16, 1983, Ser. No. 552,421
Int. Cl.⁴ B08B *3/04*
U.S. Cl. 134—115 R **5 Claims**



1. A paint roller apparatus with inherent cleaning capability comprising a Roller Assembly, Coupling, Handle, and Drive Shaft so assembled that:

a. the Coupling joins together the Roller Assembly and Handle, with the Roller Assembly and Coupling forming a rotary bearing-type relationship whereby the mating part of the Roller Assembly constitutes a hollow or partially-hollow shaft which can rotate freely within the complementary part of the Coupling which constitutes the bushing, and

b. the Handle and Coupling form a rotary bearing-type relationship whereby the mating part of the Handle constitutes a shaft which can rotate within the mating part of the Coupling which constitutes the bushing, said rotation of the Handle being limited by two stops which comprise a means for locking the Handle in two positions approximately one hundred and eighty degrees apart on the axis of rotation, said stops comprising complementary structures on the said shaft and bushing located within the said bearing structure, and said stops being located so as to lock the Handle in two positions, one position suitable for using the paint apparatus for painting, the other position suitable for using the apparatus for cleaning the paint roller pad, said cleaning operation being partly implemented by:

c. the Drive Shaft, which coaxially and detachably connects to the end the hollow shaft on the Roller Assembly that constitutes the part of the rotary bearing between the Roller Assembly and the Coupling, as mentioned in part a of this claim.

4,545,396

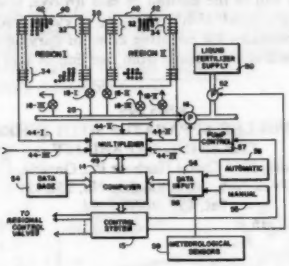
SYSTEM FOR OPTIMUM IRRIGATING AND FERTILIZING

Richard N. Miller, 4407 Lake Trudy Dr., St. Cloud, Fla. 32769, and K. Bruce Ray, 115 Orange Ave., Orlando, Fla. 32809

Filed Feb. 25, 1985, Ser. No. 705,750

Int. Cl.⁴ F16K *17/36*

U.S. Cl. 137—78.3 **2 Claims**



1. A system for automatically irrigating and fertilizing soils of groves, truck farms and the like comprising:

(a) a water supply system having

(i) at least one main pump,

(ii) a main supply line connected to said main pump,

(iii) a plurality of lateral supply lines to the areas to be irrigated and fertilized, said lateral supply lines connected to said main supply line, and

(iv) an electrically controllable valve disposed in each of said lateral supply lines;

(b) an electrically controllable injector pump having an input connected to a source of liquid fertilizer and an output connected to the input of said main pump;

(c) a multiplicity of capacitive sensors buried in the soils to be irrigated and fertilized such that said soil acts as a dielectric for said capacitive sensor; and

(d) electronic measuring means connected to said capacitive sensors for measuring independently an equivalent reactance and an equivalent resistance of each of said capacitive sensors;

(e) electronic control subsystem means connected to said electronic measuring means and having

(i) stored threshold levels of reactance representative of a required minimum moisture level for said soils,

(ii) stored threshold levels of resistance representative of a required minimum fertilizer levels for said soils,

(iii) first comparator means for receiving reactance measurements from said electronic measurement means for producing a first control signal when said reactance is below a stored reactive threshold,

(iv) second comparator means for receiving resistance measurements from said electronic measurement means for producing a second control signal when said resistance is below a stored resistance threshold,

(v) first control circuit responsive to said first control signal to energize said main pump and to open required ones of said lateral supply line valves, and

(vi) second control circuit responsive to said second control signal to energize said injector pump only if said main pump is energized.

4,545,397

FLOAT VALVE ASSEMBLY

Hideaki Yumoto, Kakogawa, Japan, assignor to TLV Co., Ltd.

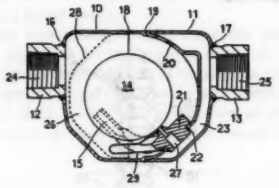
Filed Oct. 6, 1983, Ser. No. 539,535

Claims priority, application Japan, Oct. 8, 1982, 57-177766

Int. Cl.⁴ F16T *1/20*

U.S. Cl. 137—192 **4 Claims**

1. A float valve assembly comprising: valve casing means having a single valve inlet and a single valve outlet and defining a valve interior; partition means dividing said valve interior into a valve chamber which is in flow communication with said single valve inlet and into a flow passage which is in communication with said single valve outlet; valve seat means defining orifice means between said valve chamber and said flow passage; float means located within said valve chamber operating to engage and disengage said valve seat means in accordance with the level of condensate within said valve chamber to close and open said orifice means; said valve seat means and said



orifice means being located relative to said single valve outlet to effect opening and closing operation of said float means both when said single valve inlet and single valve outlet are connected within a horizontal flow line and when they are connected within a vertical flow line; and a float guide member adapted to engage said float means to urge said float means into engagement with said valve seat means, said float guide member being adapted to be adjustably positioned relative to said valve seat means to adapt said assembly for operation within either a horizontally extending flow line or a vertically extending flow line.

4,545,398

VENTING DEVICE

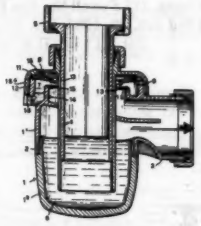
Gijsbrecht H. J. van Olst, 31 van Marnixlaan, 3818 VA Amersfoort, Netherlands

Filed Feb. 25, 1983, Ser. No. 469,871

Claims priority, application Netherlands, Feb. 26, 1982, 8200799

Int. Cl.⁴ E03C *1/295*

U.S. Cl. 137—216.2 **2 Claims**



1. A venting device for preventing escape of gases from used water sanitary conduits to the ambiance in buildings, comprising:

a used water conduit including a downwardly extending used water inlet pipe, a hollow body, and a used water outlet pipe open to the interior of said hollow body and extending laterally therefrom, said outlet pipe being spaced above the bottom of said hollow body, said inlet pipe extending downward through the top of said hollow body to a point near the bottom thereof and below said outlet pipe, said hollow body forming a water seal vertically between the bottom of said inlet pipe and the outlet pipe spaced thereabove to prevent reverse passage of gases from the outlet pipe to the inlet pipe, said water seal

being annular and radially defined by the annular space between the inlet pipe and the surrounding hollow body;

a valve seat comprising annular coaxial upward facing radially outer and inner seat edges incorporated in said body near the top thereof, said radially inner seat edge being spaced between said outer seat edge and said used water inlet pipe, said hollow body having a top through which said used water inlet pipe downwardly extends, which top overlies said seat edges and with said seat edges defines an annular air passage communicating from the ambiance outside said hollow body, upward between said outer and inner seat edges, radially inward beneath said top and above said radially inner seat edge and downward between said inner seat edge and said inlet pipe to the interior of said hollow body adjacent said used water outlet pipe;

means sealing said top to said water inlet pipe and thereby closing said top in the area above said upward facing inner and outer seat edges, said radially outer upward facing seat edge being spaced above said radially inner upward facing seat edge, the top of the radially inner seat edge being rounded;

an annular valve member of flexible material having a radially outer edge portion sealingly fixed upon said radially outer seat edge, said annular valve member having an annular reduced thickness portion immediately adjacent said radially outer seat, to flexibly hinge the major, radially inwardly extending portion of the valve member and facilitate its rise from and fall downward to the upward facing radially inner seat edge, said annular valve member having a depending annular ledge at its radially inner edge, said ledge being located radially inward of said radially inner upward facing seat edge for hooking thereonto and preventing forcing of the radially inner edge of the annular valve member downward below the top of the radially inner seat edge due to excessive overpressure in the outlet pipe, said radially inner edge of said annular valve member being spaced radially outward from said inlet pipe and therewith defining therebetween an annular passage, a closed annular space overlying said air passage and being bounded by said top and said valve member and said used water inlet pipe, said annular space between said inlet pipe and said valve member ledge communicating between said closed annular space and the lower portion of the interior of said body.

4,545,399

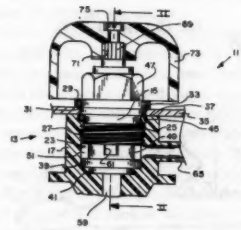
VALVE

Charles M. McGhee, 2319 Cardigan, Memphis, Tenn. 38119

Filed Nov. 14, 1983, Ser. No. 550,955

Int. Cl.⁴ F16K *43/00*

U.S. Cl. 137—315 **14 Claims**



1. In an assembled water faucet, body means having a wall and a bore therein and having an exit port and an inlet port, stem means having a lower locking surface at the lower end thereof, a removable valve seal means matingly engaging said lower locking surface for coupling said seal means with said stem means for turning movement with said stem means, said stem means and said seal means being turnably mounted in said bore for conjoint movement in the operation of said water faucet between a closed position in which said seal means blocks said exit port and open position in which said exit port is uncovered by said seal means, said seal means including at least one undercut face spaced from said wall and extending through the lower end of said seal means with the space between said face and said wall being in direct communication at all times with said inlet port to allow water flow when said seal means is in said open position, said seal means including a locking head at the upper end thereof above said undercut face defining a coacting locking surface for coupling said seal means with said stem means and said seal means including blocking means in sealing engagement with said wall, and said body means, said stem means and said valve seal means being removable together so that said said valve seal means can easily be inspected for wear.

4,545,400

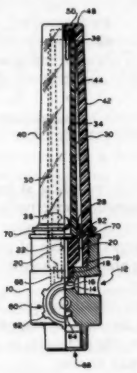
PRESSURE RELIEVING DEVICE

Arthur W. Gruber, and Loren C. Smith, both of Virginia Beach, Va., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Apr. 21, 1983, Ser. No. 488,242

Int. Cl.⁴ F16K *17/00*

U.S. Cl. 137—467 **10 Claims**



1. A fluid pressure relieving device comprising:

an O-ring;

means having a passage for enabling the fluid to contact the O-ring and sized to allow sufficient flow to relieve a fluid pressure substantially in excess of normal operating pressure;

means for compressing and retaining the O-ring to provide a fluid tight seal for pressures up to at least 50 pounds per square inch and having a gap positioned such that upon the occurrence of an excessive pressure the O-ring moves irreversibly in the gap and the excessive pressure is relieved by fluid flow through the gap and the passage; and

a flow restrictive means upstream from the gap and sized to limit the fluid flow through the gap and the passage upon the movement of the O-ring.

4,545,401

FLUID FLOW REGULATOR

John J. Karpis, The Toledo Apt. #4, Long Beach, Calif. 90803

Filed Sep. 28, 1982, Ser. No. 425,772

Int. Cl.⁴ F16K *31/38*

U.S. Cl. 137—487 **12 Claims**

1. A fluid flow regulator, comprising:

a housing within which a fluid flow passageway is defined through which a fluid flow to be controlled moves, a

servo valve passage and a throttle valve passage connecting the fluid flow passageway to the servo valve passage;

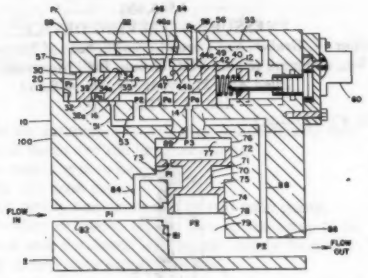
throttle valve means mounted within the throttle vale passage to control the flow through the fluid flow passageway; and

servo valve means mounted within the servo valve passage, said servo valve means including

an axially spaced pair of actuators defining with said servo valve passage a pressure chamber at each end of the actuators subjected to a reference pressure and a pressure chamber between the actuators, each actuator comprising at least two axially spaced pistons between which at least one pressure chamber is defined;

biasing means situated within a pressure chamber at one end of the actuators for exerting a biasing force against the actuators; and

means defining a leakage port, wherein:



(i) said actuators each including at least a pair of spaced apart surfaces exposed, respectively, to an end pressure chamber and the pressure chamber between the actuators, the spaced apart surfaces of one actuator defining a greater pressure area than the spaced apart surfaces of the other actuator.

(ii) said actuators are joined together to move as a unit in said servo valve passage in response to the resultant force generated by the pressures in said pressure chambers and said biasing means;

(iii) one of said actuators is situated to directly control, in response to said resultant force, the opening of the throttle valve passage at the servo valve passage; and

(iv) the pressure chambers defined between the spaced pistons of each actuator are connected to the means defining the leakage port and subjected to the same pressure which is equal to or less than the reference pressure.

4,545,402

PRESSURE-REGULATING VALVE WITH A FORCE-FEEDBACK

Michael D. Lyons, Lexington, Ky., assignor to American Standard Inc., Lexington, Ky.

Filed Apr. 12, 1984, Ser. No. 599,405

Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—495 **9 Claims**

1. A valve having a force-feedback indicating fluid delivery of said valve, said valve comprising:

(a) a valve housing;

(b) an operable actuator member secured to a rotatable shaft extending partially within said valve housing;

(c) valve means disposed within said valve housing for controlling the delivery of such fluid according to said actuator member operation;

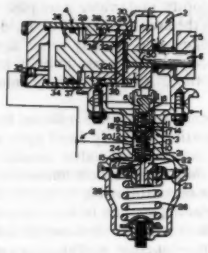
(d) a force cam connected to said shaft for rotational movement therewith;

(e) at least one cam slot formed on a portion of said force cam, said at least one cam slot formed angularly relative to the axis of said force cam;

(f) a nonrotatable annular ring fixedly disposed in said valve housing, said annular ring coaxially surrounding at least a portion of said force cam;

(g) at least one guide slot formed on said annular ring in parallel relation to the axis of said annular ring, said at least one guide slot being disposed adjacent said at least one cam slot;

(h) a follower pin extending between said at least one guide slot and said at least one cam slot, said follower pin being



movable in an axial direction by a cam force exerted upon rotation of said force cam; and

(i) a feedback piston movable within a piston chamber disposed adjacent said force cam, said feedback piston contacting said follower pin and exerting a piston force on said follower pin which is a function of such delivered fluid pressure, such piston force being exerted in a direction opposite such movement of said follower pin resulting from rotation of said force cam; and

(j) feedback means connected between said piston chamber and said valve means for communicating such delivered fluid pressure to said piston chamber.

4,545,403

FLOW REGULATING DEVICE

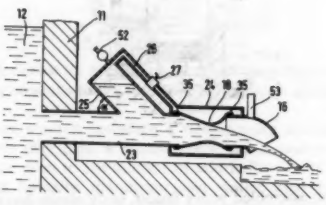
Daniel Vischer, and Peter Volkart, both of Zürich, Switzerland, assignors to Hansjorg Brombach and Heinrich Hohlwegler, both of, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 477,885

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210718

Int. Cl.[4] G05D *7/00*

U.S. Cl. 137—497 **22 Claims**



1. A device for automatically regulating liquid flow in pipelines and the like, with a flexible hose coupling forming at least part of a liquid flow path between an inlet and an outlet of the device, comprising:

an encasing in which the hose coupling is so disposed as to

form a sealed gap there between, the hose coupling being radially pretensioned;

a branch flow path from the inlet directed upwardly and oppositely in direction relative to the liquid flow path, having a closed upper end; and,

a gas-tight line communicating between the upper end of the branch flow path and the gap between the encasing tube and the hose coupling, thereby indirectly subjecting the outside of the hose coupling to the pressure of the liquid flowing therethrough, whereby the flexible hose coupling becomes more and less constricted in response to variations in the liquid flowing through the device.

4,545,404

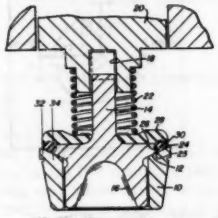
BONDED VALVE WITH REPLACEABLE INSERT

Fletcher H. Redwine, Garland, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 474,082, Mar. 10, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,149

Int. Cl.⁴ F16K *15/06*

U.S. Cl. 137—516.29 **6 Claims**



1. In a poppet-type valve, said valve including a reciprocable metal valve member and a metal seat member, said members having mateable tapered annular seating surfaces for making sealing contact, said reciprocable valve member having a replaceable insert of elastomeric material installed in a groove in said reciprocable member, said insert having a tapered annular seating surface for making sealing contact with the seating surface of said metal seat member,

the improvement in said poppet-type valve which comprises:

said reciprocable metal valve member having an outer annular groove of circular arc-shape,

said elastomeric material having a circular arc-shaped surface mateable with the groove in said reciprocable metal valve member, said elastomeric insert being adapted to be received in the groove of said valve member,

said reciprocable metal valve member having an elastomeric backup member bonded to a transverse metal surface of said reciprocable member, opposite from the tapered annular seating surface of said reciprocable valve member,

said elastomeric insert having a higher durometer hardness than said elastomeric backup member,

said backup member abutting at least a major portion of a transverse surface of said elastomeric insert at a location opposite the tapered seating surface of said insert,

the extent of said transverse surface of the insert being defined by boundaries intercepted by directions parallel to the axis of said reciprocable valve member through upper and lower ends of the tapered surface of said insert as viewed in an axial cross-section of said reciprocable valve member.

4,545,405

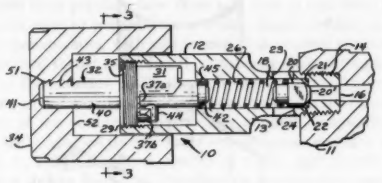
MULTI-POSITION RELIEF VALVE

Charles E. LaBelle, Oostburg, Wis., assignor to Thomas Industries, Inc., Louisville, Ky.

Filed Nov. 9, 1983, Ser. No. 550,299

Int. Cl.⁴ F16K *17/06*

U.S. Cl. 137—524 **9 Claims**



1. A multi-position relief valve for use with a dynamic source of compressed fluid, said relief valve comprising:

a housing having a portion internally threaded and a body portion,

said body portion defining an inlet, an outlet, a passageway communicating with said inlet said outlet and a valve seat located within the passageway;

a valve member positioned in said housing and movable to a valve closing position where it cooperates with the valve seat to maintain the inlet out of communication with said outlet;

bias means for establishing a force for biasing said valve member to said valve closing position; and

limit select means including a limit select member and a rotatable adjustment member cooperating with said limit select member in controlling said bias means to establish a pressure limit value at which the valve member is movable from its valve closing position under the force of compressed fluid supplied to said inlet, said limit select member having external threads adapted to be received by said housing having a portion internally threaded to preset the multi-position relief valve, said rotatable adjustment member being movable to vary the biasing force of said bias means, said limit select member defining a plurality of discrete stop positions positioned about the circumference of said select member for engagement by said rotatable adjustment member, each stop position corresponding to a different preselected pressure limit for the relief valve; and

means for indicating the pressure limit corresponding to the position of the rotatable adjustment member.

4,545,406

VALVE POSITION INDICATOR AND METHOD

Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Continuation-in-part of Ser. No. 221,933, Dec. 31, 1980, abandoned. This application Apr. 6, 1983, Ser. No. 482,496

Int. Cl.⁴ F16K *37/00*

U.S. Cl. 137—553 **2 Claims**

1. A method for continuously monitoring the position of a device driven by a hydraulic system in which there is flexibility in expansion and contraction of the hydraulic system when it is pressurized and when the pressure is relaxed and also in which lost motion is inherent due to mechanical clearances, comprising the steps of:

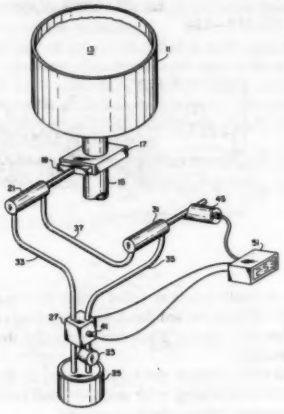
(a) continuously measuring the volume and direction of flow of the driving hydraulic fluid,

(b) continuously computing a net uncorrected volume of flow by subtracting the volume of flow in a first direction from the volume of flow in the opposite direction,

(c) continuously computing a first corrected volume of flow by correcting the net uncorrected volume of flow for flows due to the expansion of the hydraulic system,

(d) continuously computing a second corrected volume of flow by correcting the first corrected volume of flow for flows due to the relaxation of the hydraulic system,

(e) continuously computing a final corrected volume of flow



correcting the second corrected volume of flow for flows due to lost motion elimination of mechanical clearances in the system and device, and

(f) continuously converting the final corrected volume of flow to a signal for the position of the device.

4,545,407

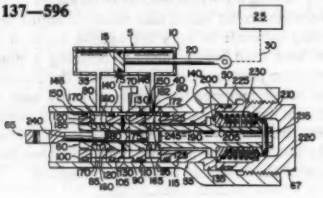
JAM COMPENSATING CONTROL VALVE

Carl S. Dudash, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 29, 1984, Ser. No. 584,676

Int. Cl.⁴ F15B *13/04, 20/00*

U.S. Cl. 137—596 **6 Claims**



1. A control valve adapted for controlling the pressurization of an hydraulic actuator, said control valve including an inlet port adapted for connection to a source of pressurized hydraulic fluid, outlet ports adapted for connection to the cylinder of the hydraulic actuator, a drain port for draining said actuator, and a movable valve spool for selectively opening and closing a flow passage between said inlet and outlet ports, said control valve being characterized by:

an outer sleeve including first radially oriented inlet and outlet passages therein;

an inner sleeve received within said outer sleeve and being normally stationary with respect thereto, said inner sleeve including second radially oriented inlet and outlet passages therethrough in normal alignment with said first inlet and outlet passages, said inner sleeve further including in the surface thereof, drain grooves adjacent said second outlet passages and a drain slot communicating with said drain port and intersecting said drain grooves;

said spool, in normal operation, being slidably disposed interiorly of said inner sleeve and including lands in selective registry with said second inlet and outlet passages, whereby slidable movement of said spool within said inner sleeve selectively opens and closes said second inlet and outlet passages to effect selective pressurization of said hydraulic actuator; and

alignment means for maintaining said alignment of said first and second inlet and outlet ports in said inner and outer sleeves under normal operating conditions, and yielding to movement of said inner sleeve with respect to said outer sleeve under conditions of jamming between said inner sleeve and said spool, whereby joint, axial movement of said inner sleeve and said valve spool due to jamming therebetween, connects said drain grooves and therefore, said drain slot with said first outlet passages for depressurization of said actuator by draining thereof.

4,545,408

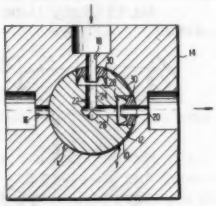
SEAL FOR A ROTARY HYDRAULIC VALVE

Lamburtus J. Sonneborn, Oldenzaal, Netherlands, assignor to Applied Power, Inc., Milwaukee, Wis.

Continuation of Ser. No. 415,231, Sep. 7, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 680,221

Int. Cl.⁴ F16K *5/14*

U.S. Cl. 137—625.46 **1 Claim**



1. A hydraulic rotary valve comprising:

a housing having an internal bore and a plurality of apertures opening into said bore;

a valve body positioned in said bore and rotatable therein;

a flow conduit located in said valve body such that said conduit communicates with a plurality of said apertures when said valve is in an operable flow position;

a longitudinally extending seal retaining means located at each end of said conduit and forming a pair of recessed areas in said valve body; and

a longitudinally extending elongate fluid seal located within each of said longitudinally extending recessed areas in said valve body, each of said seals having

a central passageway for the flow of fluid to be valved positioned transverse to the direction of longitudinal extent of said seal

a first seal surface extending generally perpendicular to said central passageway and having an arcuate sealing configuration compatable with a wall of the internal bore of said housing, said first surface being adapted to function as a sealing surface when said seal is in use,

second and third longitudinally extending seal surfaces located on either side of said central passageway and extending from said passageway in a concavely arcuate direction,

a fourth longitudinally extending elongate surface extending from said second surface and forming a first leg of said seal, and

a fifth longitudinally extending surface extending from said third surface and forming a second leg of said seal, wherein said fourth and fifth surfaces are trough-shaped and said first and second legs of said seal are tapered, and wherein said seal is axially wider in a relaxed condition than said retaining means and is positioned in said retaining means in a pre-stressed condition, such that

when pressurized fluid is passed from said conduit within said valve body and through said central passageway of said seal to an aperture in said housing, said first and second legs of said seal form a sealing relationship with said valve body and said first surface forms a sealing relationship with the wall of the bore of said housing to prevent leakage of pressurized fluid within said hydraulic rotary valve.

4,545,409

ELECTROHYDRAULIC, TWO-STAGE, PROPORTIONAL DISPLACEMENT VALVE

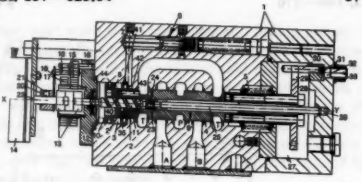
Horst Luhmer, Kaarst, Fed. Rep. of Germany, assignor to Integral Hydraulik & Co., Dusseldorf, Fed. Rep. of Germany

Filed Apr. 13, 1984, Ser. No. 600,122

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313317; Apr. 13, 1983, 3313318

Int. Cl.[4] F15B *13/043*

U.S. Cl. 137—625.64 **17 Claims**



1. An electrohydraulic, two-stage proportional displacement valve comprising:

a valve housing;

a cylinder in said housing;

a main control piston mounted in said cylinder for axial displacement having two operating piston faces for selectively moving said piston axially in opposite directions, one of said piston faces having twice the area of the other;

an interior main bore in said main piston;

an advance control piston rotatably mounted in said main bore;

an inclined trapezoidal thread in the outer surface of said advance control piston forming a two-edge control element and communicating at one end of said thread with said one face of said main piston;

an outlet for said bore extending through one end of said main piston communicating said main bore with said cylinder;

a source of hydraulic pressure;

means to connect said source of hydraulic pressure to said other face of said main piston and to said main bore; and

an electric stepping motor operatively connected to said advance control piston to rotate said advance control piston to selectively connect said trapezoidal thread to said source of hydraulic pressure fed to said main bore.

4,545,410

SYSTEM FOR TRANSFERRING DRY FLOWABLE MATERIAL

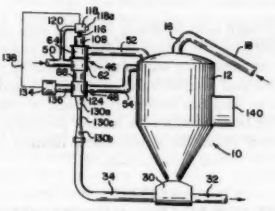
Kermit D. Paul, Henderson; Charles F. Addams, Jr., and Frederick S. Wuertele, both of York, all of Nebr., assignors to Cyclonaire Corporation, Henderson, Nebr.

Filed Jan. 30, 1984, Ser. No. 575,179

Int. Cl.[4] B65B *1/04*

U.S. Cl. 141—18 **9 Claims**

1. A system for transferring dry flowable material comprising, in combination; a substantially closed vessel defining an inlet adapted to receive flowable material therein and a discharge end enabling discharge of material from said vessel, a cycle valve, a first flow conduit communicating with said cycle valve and adapted for connection to a source of pressurized fluid flow, a second flow conduit communicating with said cycle valve so as to enable selective pressurized fluid flow therethrough from said cycle valve, a third flow conduit communicating with said cycle valve and said vessel so as to enable flow of pressurized fluid from said cycle valve to said vessel, said cycle valve being selectively operable between a first condition operative to effect fluid pressure flow from said first to said second flow conduits, and a second condition operative to effect fluid pressure flow from said first to said third flow conduits so as to pressurize said vessel, means defining a venturi communicating with said second flow conduit and having a restricted throat such that fluid pressure flow through said second flow conduit passes through said venturi and normally creates a predetermined reduced pressure within the restricted throat of the venturi, a fourth flow conduit communicating with said restricted throat of said venturi means and said vessel so as to effect a suction condition within said fourth flow conduit during fluid flow through said venturi from said second conduit, and control means operatively associated with said cycle valve so as to automatically cycle said cycle valve between its said first condition wherein a suction is created



within said vessel sufficient to effect filling thereof with flowable material, and its said second condition operative to introduce fluid pressure into said vessel sufficient to effect discharge of flowable material from said discharge end, said control means including a pressure responsive control switch directly communicating with said restricted throat of said venturi in a manner to detect pressure changes therein, said control means being operative in response to a first fluid pressure detected within the throat of said venturi to condition said cycle valve so as to effect filling of said vessel to an extent that flowable material is drawn through said fourth conduit into said venturi to increase the pressure within said throat, said pressure responsive switch being operative in response to a predetermined pressure increase within said venturi throat to condition said cycle valve so as to pressurize said vessel and effect discharge of material therefrom until the fluid pressure within said vessel and said fourth conduit returns the pressure in said venturi throat to said first fluid pressure therein whereby to automatically condition said cycle valve to again effect filling of said vessel.

4,545,411

METHOD AND APPARATUS FOR REDUCING BOILER SOOTBLOWING REQUIREMENTS

Robert B. Wierzba, Bridgeview; Robert G. Snyder, Palos Heights, and Blaise H. Kleefisch, Riverdale, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

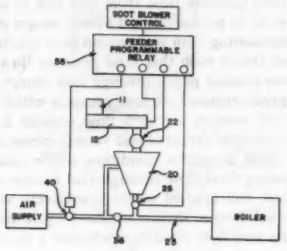
Filed Sep. 19, 1983, Ser. No. 533,568

Int. Cl.[4] B65B *55/24;* B05D *7/22*

U.S. Cl. 141—91 **8 Claims**

2. Apparatus for feeding a measured amount of powdered slag control chemical into a solid fuel fired boiler for providing a cleavage plane to the fireside surfaces of heat exchanger tubes, which apparatus comprises a storage vessel adapted to receive a measured amount of powdered chemical, said vessel having an inlet and an outlet, means for feeding a measured amount of chemical to said vessel from a bulk supply source, first valve means between said feeding means and the inlet of

said vessel, an air supply line connected between the outlet of said vessel and said boiler, means for controlling the air supply to said air supply line, second valve means between the outlet and said air supply line, a feedback line between said air supply line and said vessel, check valve means in said air supply line to divert a predetermined amount of the air pressure from the



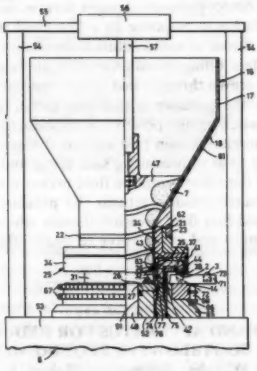
supply line through said feedback line and into the vessel to assist in discharging the chemical from the vessel, and programmable relay means for sequentially operating said feeding means, said first and second valve means, and said air supply control means to feed the measured amount of chemical from the vessel to the boiler and feed a further measured amount of material into said vessel for a subsequent feeding cycle.

4,545,412

MACHINE FOR FILLING A CONTAINER WITH PHARMACEUTICAL PRODUCTS FORMED BY PASTE

Ernesto Gamberini, Rostignano-Pianoro, Italy, assignor to MG2 S.p.A., Pian di Macina Pianoro, Italy

Filed May 25, 1983, Ser. No. 497,825
Claims priority, application Italy, May 25, 1982, 3437 A/82
Int. Cl.⁴ B65B *3/04*
U.S. Cl. 141—129 **6 Claims**



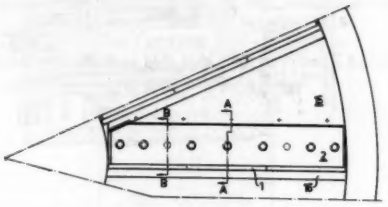
1. A machine for filling capsules with a pharmaceutical paste, comprising a hopper for said paste; a first outlet for said paste provided on said hopper; first pressure means cooperating with said hopper to push said paste in said hopper towards said first outlet; at least one dosing chamber for said paste; a first inlet and a second outlet for said paste provided on said dosing chamber, said first inlet communicating with said first outlet; a conveyor for a plurality of paste receiving bottom portions of capsules, said second outlet facing said conveyor; a dosing member arranged inside said dosing chamber and movable therein between a paste receiving position and a paste dispensing position; and a second inlet and a third outlet for said paste provided on said dosing member; said second inlet communicating with said first inlet when said dosing member is arranged in said paste receiving position, said third outlet communicating with said second outlet when said dosing member is arranged in said paste dispensing position, and second pressure means being provided which cooperates with said dosing member to push the paste therein towards said third outlet.

4,545,413

DEVICE FOR USE IN WOOD CHIPPERS

Ake Sundberg, Iggesund, and Gunnar Lindmark, Hudiksvall, both of Sweden, assignors to Aktiebolaget Iggesunds Bruk, Sweden

Continuation of Ser. No. 215,946, Dec. 12, 1980, abandoned. This application Apr. 14, 1983, Ser. No. 485,072
Claims priority, application Sweden, Dec. 12, 1979, 7910256
Int. Cl.⁴ B27C *1/00*
U.S. Cl. 144—176 **9 Claims**



1. In a wood chipper of the type comprising a rotary disc whereof one disc face is fitted with substantially radially positioned knives which are attached to said disc face by means of a knife holder, in which the knife holder comprises a plate having a log guiding surface of twisted form for guiding the wood, the log guiding surface being formed by grinding of the log guiding surface of the knife holder while the latter is clamped in a grinding fixture in a state of torsion in comparison with its original neutral state, the degree of torsion being such that the desired twisted form is given to the log guiding surface of the knife holder when the latter, after removal from the grinding fixture, is clamped in the original neutral state in the rotary chipping disc.

7. A method of fabricating a knife holder for use in connection with wood chippers of the type comprising a rotary chipping disc whereof one face is fitted with substantially radially positioned knives which are attached thereto by means of knife holders incorporating a log guiding surface for giving a twisted form to the log guiding faces of the knife holders, comprising the steps of:

(a) clamping the knife holder in a guiding fixture with the holder being in a state of torsion,

(b) surface grinding the log guiding surface of the knife holder while clamped in the fixture to provide the desired twisted form to the log guiding surface of the knife holder when removed from the fixture,

(c) removing the knife holder from the grinding fixture, and

(d) clamping the ground knife holder in a torsion-free state in a chipping disc.

4,545,414

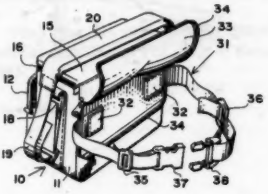
BELT-SUPPORTED CAMERA BAG

Frank M. Baum, 1030 E. 30th St., Hialeah, Fla. 33013

Filed Feb. 21, 1984, Ser. No. 581,805
Int. Cl.⁴ A45C *3/10*
U.S. Cl. 150—52 J **4 Claims**

1. A belt supported camera bag comprising, in combination, a substantially rectangular main camera bag compartment of flexible material, an auxiliary camera bag compartment of flexible material secured against one side of said main camera

bag compartment, a flexible shoulder carrying strap the ends of which are secured with respect to one end each of said main camera bag compartment, a flexible waist carrying strap end portions of which are secured in mutually transverse spaced relation to the other side of said main camera bag compartment, means for enclosing and hiding said waist carrying strap against said other side of said main camera bag compartment when not being used as a belt for securement about the waist of



the user, said waist strap enclosing and hiding means comprising a substantially rectangular flexible fabric panel sewn along one edge against said other side of said main camera bag compartment so as to be foldable over said flexible waist carrying strap when said waist carrying strap is folded in abutment against the outside of said other side of said main camera bag compartment, and a slide fastener sewn along the free edge of said cover flap and said outside of said other side of said main camera bag compartment.

4,545,415

PNEUMATIC TIRE TREAD

Daniel J. Lindner, Canal Fulton; Ronald L. Loeffler, Akron, both of Ohio; Harold D. Fetty, Asheville, N.C., and Jeffrey L. Plauny, Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 26, 1983, Ser. No. 536,060

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.⁴ B60C *1/08*

U.S. Cl. 152—209 R **9 Claims**

1. A radial pneumatic passenger tire comprising a ground engaging tread portion, said tread portion having a pair of lateral tread edges, said tread portion comprising a first plurality of main grooves which follow substantially the same path across the tread from tread edge to tread edge, each of said main grooves having a central portion, a pair of first intermediate portions, a pair of second intermediate portions and a pair of shoulder portions, said central portion being disposed substantially in the axially central portion of the tread portion and having a width in the range of 5 percent to 15 percent of the width of the tread portion, each of said first plurality of main grooves in said central portion being oriented at an angle in the range of 20° to 40° with respect to the mid-circumferential centerplane of the tire, one of said first intermediate portions is disposed adjacent each axial side of said central portion, the width of each of said first intermediate portions being in the range of about 10 percent to 20 percent of the width of the tread, said first plurality of main grooves in said first intermediate portion being oriented at an angle that is greater than said central portion angle by about 15°, one of said second intermediate portions is disposed axially outwardly and adjacent each of said first intermediate portions, said first plurality of main grooves in said second intermediate portion being oriented at an angle that is greater than the first intermediate portion angle by about 10°, the width of said second intermediate portion being from about 10 percent to 15 percent of the width of said tread, the width of said central portion, said pair of first intermediate portions and said pair of second intermediate portions being no greater than about 80 percent of the width of the tread, one of said shoulder portions is provided axially outwardly and adjacent each of said second intermediate portions, said first plurality of main grooves in said shoulder region being oriented at an angle axially outwardly toward the closest respective tread edge in a substantially axial direction, said first plurality of main grooves being spaced circumferentially apart a distance in the range of about two percent to three percent of the circumference of the radially outer surface of said tread portion taken at the mid-circumferential centerplane of said tire, a second plurality of main grooves are provided each of which follow substantially the same path across the tread from tread edge to tread edge, each of said second plurality of main grooves have a configuration which is substantially the mirror image of said first plurality of grooves, said first plurality of main grooves and said second plurality of main grooves extend axially outward from said central portion to the tread edge in a substantially axial direction, said first plurality of main grooves are circumferentially offset from said second plurality of main grooves, as measured at mid-circumferential centerplane, a distance in the range of 25 percent to 50 percent of the distance which said first plurality of main grooves are spaced circumferentially apart.

4,545,416

RADIAL TIRES

Michio Itoh; Takehiro Tsukamoto, both of Higashimurayama; Shuichi Watanabe, Tokyo; Takeshi Kinoshita, Higashiyamato, and Seisuke Tomita, Tokorozawa, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,721

Claims priority, application Japan, Mar. 16, 1982, 57-40232

Int. Cl.⁴ B60C *9/00, 1/00*

U.S. Cl. 152—539 **3 Claims**

1. Radial tires wherein a rubber composition, to be used for embedding steel cord of at least one of belt and carcass of a radial tire, comprises 0.5–10 parts by weight of a transition metal salt selected from a cobalt salt and a nickel salt of at least one of a primary fatty acid having 6–10 carbon atoms, 100 parts by weight of at least one rubber component selected from the group consisting of natural rubber, synthetic polyisoprene rubber, polybutadiene rubber and styrene-butadiene copolymeric rubber and 0.1–5 parts by weight of boric acid or a metal salt of boric acid based on 100 parts by weight of the rubber component.

4,545,417

WIDE SPAN OVERHEAD DOOR

Robert W. Todd, P.O. Box 561, Wilsonville, Oreg. 97070

Filed Jun. 20, 1983, Ser. No. 506,023

Int. Cl.⁴ E05D *15/26*

U.S. Cl. 160—207 **1 Claim**

1. For use with a structure having an opening defined by a header beam and a pair of laterally spaced apart side door jambs, an overhead door of the folding type, comprising:

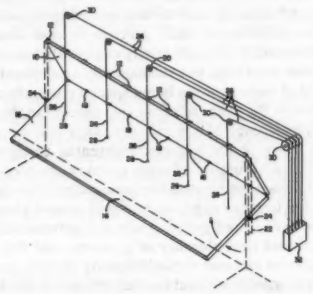
(a) a pair of door sections sized to accommodate said open-

ing, the pair of door sections including an upper section arranged to be mounted pivotally to the header beam of the structure and a lower section mounted pivotally at its upper end to the bottom end of the upper section, the upper section being less than half the length of the lower section,

(b) vertically extending guide track means mounted on each side door jamb configured to retain a guide roller therein,

(c) a guide roller mounted on the lower section adjacent each side door jamb and at a distance below the upper end of the lower section about equal to the length of the upper door section, the roller being arranged for vertical movement in and retention by said guide track means,

(d) at least one lift cable connected at one end to the lower door section intermediate the longitudinal ends thereof at a point below the guide roller at which the weight of the



upper and lower door sections extending in one direction from said point and the weight of the lower door section extending in the opposite direction from said point are substantially balanced, the lift cable being connected to the lower door section at a point determined by the equation $(2x+L)x=[y-(2x+L)]2y$, wherein x is one half the height of the upper door section, y is one half the height of the lower door section, and L is the distance from the said connection point to a point on the lower door section spaced from the upper end of the lower door section by the distance 2x, and the total height of the door is determined by the equation $H=2x+2y$, the cable means extending vertically upward beyond the upper door section, and

(e) counterweight means connected to the other end of each said lift cable and arranged to substantially counterbalance the weight of the door.

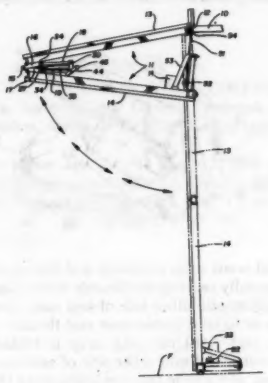
4,545,418

LOCKING DEVICE FOR CENTER FOLD HANGAR DOOR

John F. List, Edinburg, and William M. Nunn, III, New Castle, both of Pa., assignors to Fleming Steel Company, New Castle, Pa.

Filed Aug. 16, 1984, Ser. No. 641,260
Int. Cl.⁴ E05D *15/00*
U.S. Cl. 160—213 **9 Claims**

1. An improvement in a locking device for center fold hangar doors, said doors having an upper leaf including an upper portion pivotally mounted by an upper hinge for swinging about a fixed horizontal axis and a lower free edge adapted to be moved between a first elevated open position and a second lowered closed position; a lower leaf having an upper portion pivotally mounted on said lower free edge of said upper leaf and a lower portion, said upper portion of said lower leaf adapted to be moved between a first elevated open position and a second lowered closed position; the improvement comprising means pivotally joining the lower free edge of said upper leaf and the upper portion of said lower leaf for preventing horizontal movement in one direction of said upper leaf and said lower leaf when the same are in said second positions, said means including members on said upper leaf and said lower leaf and a pivot pivoting said members to one another, arms pivoted respectively to said members spaced from said pivot pivoting said members and a body member pivoted to said arms in spaced relation to said members, telescopic mem-



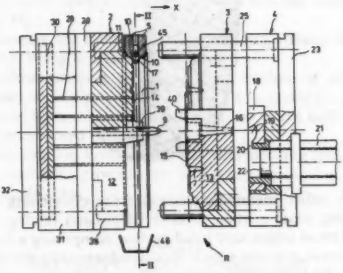
bers positioned horizontally between said pivoted members and said body member, one of said telescopic members being pivotally affixed to the said pivot and the other of said telescopic members affixed to said body member and means for locking said telescopic members to one another when said upper leaf and said lower leaf are in said second positions.

4,545,419

DEVICE FOR MANUFACTURING WHEELS FOR VEHICLES

Herbert Zulauf, Feuerthalen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jan. 12, 1981, Ser. No. 224,472
Claims priority, application Switzerland, Jan. 30, 1980, 761/80
Int. Cl.⁴ B22D *17/22, 19/00*
U.S. Cl. 164—111 **13 Claims**



1. An apparatus for manufacturing vehicle wheels having a rim portion surrounding a cast wheel body comprising a moveable die plate and center plate, said moveable die plate and said center plate defining with said rim a mold space for said wheel body wherein said rim is provided with a plurality of projections radiating from said rim into said mold space.

4,545,420

APPARATUS FOR DETERMINING MOLD WALL WEAR DURING CASTING AND FOR DETERMINING SHRINKAGE OF THE CASTING FROM THE INNER WALL OF THE MOLD

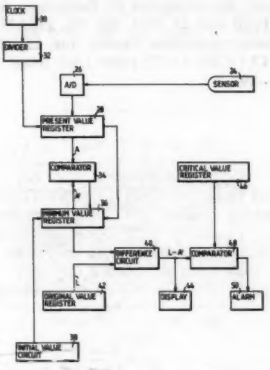
Burkhard Christmann; Jörg Weber, both of Berlin, and Gerhard Stadtfeld, Duisburg, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt and Mannesmann Aktiengesellschaft, D/ sseldorf, both of, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,676

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309885

Int. Cl.⁴ B22C *19/04*

U.S. Cl. 164—150 **13 Claims**



1. An apparatus for determining the wear of mold walls during a casting process in which a casting moving through the interior of the mold occasionally lifts itself away from the mold walls, comprising:

at least one distance measuring sensor installed in one of the mold walls at a position wherein it will not contact the casting even if the mold wall has been worn off during operation, said at least one sensor providing a distance signal corresponding to one of the distance from the surface of said one of the mold walls to said at least one sensor and the distance from the casting to said at least one sensor;

minimum value memory means operatively connected to said at least one sensor for storing a value corresponding to the distance signal produced by said at least one sensor when the distance from the casting to said at least one sensor is at a minimum, and for erasing the previous value stored; and

mold wall wear determination means operatively connected to said minimum value memory means for determining the difference between the value stored by said minimum value memory means and an initial predetermined value corresponding to the distance between said at least one sensor and the surface of said one of the mold walls before mold wear began.

4,545,421

NONSKID BOX STUDS

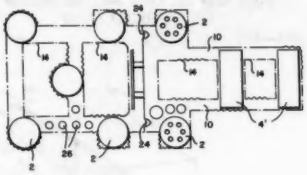
Wolfgang Baetz, Grossalmerod; Albrecht Graefer, Kaufungen, and Edgar Löw, Schmitten, all of Fed. Rep. of Germany, assignors to Karl Schmidt Fabrik fur Giessereibedarf GmbH & Co., Schmitten, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,671

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 8335255[U]

Int. Cl.⁴ B22C *21/14*; B29C *9/10*

U.S. Cl. 164—397 **10 Claims**



1. Aparatus for supporting two casting cores comprising a plurality of supporting elements, each of said supporting elements comprising first and second support plate means for engaging a respective one of said casting cores and separated by separation means, and interconnecting means for interconnecting said plurality of supporting elements, said means for interconnecting being connected to each of said supporting elements, said supporting element and said means for interconnecting being made of a fusible material.

4,545,422

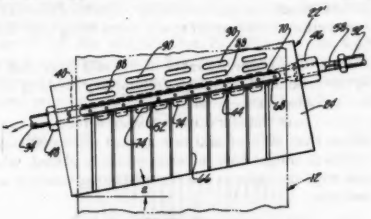
MACHINE FOR CONTINUOUSLY CASTING BATTERY GRIDS

Jack E. McLane, Port Huron, and Raymond L. Schenk, Marysville, both of Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Filed Oct. 19, 1983, Ser. No. 543,493

Int. Cl.⁴ B22D *11/10*

U.S. Cl. 164—429 **19 Claims**



18. In a machine for continuously casting battery grids wherein the battery grid pattern is formed as a cavity around the peripheral surface of a rotating cylindrical drum, said grid cavity comprising a plurality of axially spaced, circumferentially extending grooves and a plurality of circumferentially spaced, axially extending grooves on the peripheral surface of the drum and lead is directed into the grid cavity by means of a shoe in mating engagement with the peripheral surface of the drum and having a molten lead passageway therein which is open to the surface of the drum by means of an orifice slot extending transversely across the drum, that improvement which comprises the orifice slot having an upstream edge which is inclined axially at a slight angle to the axially extending grooves on the drum in the range of about 5° to 15° and means for directing molten lead into said passageway at superatmospheric pressure and in an amount in excess of that re-

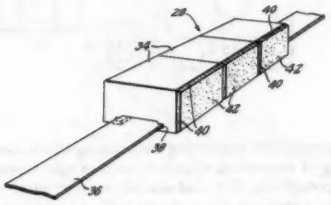
quired to progressively fill the grid cavity as it rotates past the orifice slot.

4,545,423

REFRACTORY COATING OF EDGE-DAM BLOCKS FOR THE PURPOSE OF PREVENTING LONGITUDINAL BANDS OF SINKAGE IN THE PRODUCT OF A CONTINUOUS CASTING MACHINE

Stanley W. Platek, Essex Junction; S. Jerry Desautels, and Wojtek Szczypiorski, both of Colchester, all of Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Filed May 10, 1983, Ser. No. 493,359
Int. Cl.⁴ B22D *11/06*
U.S. Cl. 164—481 **36 Claims**



11. The method for continuously casting metal product of a thickness between ¼ inch (6 mm) and 3 inches (75 mm) and of a width at least four times its thickness, directly from molten metal, wherein the molten metal is introduced into a moving mold, said moving mold being defined between opposed moving mold surfaces and laterally defined by first and second traveling edge dams consisting of flexible strings of blocks mainly metallic, the method comprising, prior to casting the metal product:

applying an adherent intermediate layer of refractory metal to those faces of the said edge-dam blocks which will normally be contacted by molten metal, and

applying an adherent layer of molten insulative refractory ceramic to the refractory metal on those faces of the said edge-dam blocks which would normally be contacted by molten metal, the said insulative refractory ceramic being non-wetting with respect to the metal being cast, followed by:

hardening the remaining faces of the said edge-dam blocks by the process of nitriding, without any masking of previously coated surface, whereby:

the rate of heat transfer during casting is reduced to a value of less than 80% of said rate against untreated edge-dam blocks of similar base material similarly placed, while the said edge-dam blocks are rendered long wearing at minimal cost.

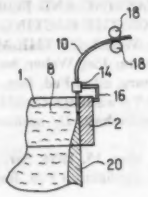
4,545,424

METHOD OF CONTINUOUSLY CASTING STEEL

Takayuki Sato, Osaka, Japan, assignor to Satosen Co., Ltd., Osaka, Japan

Filed Nov. 21, 1983, Ser. No. 554,037
Claims priority, application Japan, Apr. 26, 1983, 58-74787
Int. Cl.⁴ B22D *11/04*
U.S. Cl. 164—491 **4 Claims**

1. A method of continuously casting steel with use of a copper or copper alloy mold comprising a pair of long side mold pieces and a pair of short side mold pieces slidable along the long side mold pieces for changing the width of the slab while the slab is being produced, the method including continuously inserting into the mold only at each corner thereof, while the slab is being continuously cast, four continuous cooling members made of a material identical or substantially identical with the steel being cast and while continuously casting the slab and continuously inserting said continuous cooling members into each of said corners, slidingly moving the short side mold pieces clamped under reduced clamping



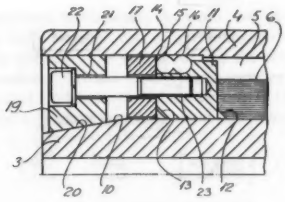
pressure between said long side mold pieces relative to said long side mold pieces and thereby changing the width of the slab as the slab is being continuously cast.

4,545,425

MOUNTING DEVICE

Kjell Johansson, Styrmansgatan 19, Falkenberg, Sweden

Filed Jun. 23, 1981, Ser. No. 276,475
Claims priority, application Sweden, Jun. 25, 1980, 8004680
Int. Cl.⁴ F28D *11/02*; F28F *5/02*; B60B *7/06*
U.S. Cl. 165—89 **4 Claims**



1. The structure for providing an annular space, fluid retaining area about a roller-shaped body, which body is normally mounted for rotation on a shaft structure, the resultant structure providing a singular structure, the structure including:

a. a jacket having an inner shape and size to provide an annular space interiorally thereof when positioned about the roller shaped body;

b. a nut ring positioned respectively on each of the ends of the roller body and secured thereto to prevent axial movement thereof and being provided with a plurality of circumferentially spaced, blind passages therein;

c. at least certain of said passages being threaded to receive threaded attachment members therein as received from the respective ends of said roller body;

d. said nut ring being provided with a sealing ring receiving seat about the outer periphery thereof, said surface being directed outwardly towards the inner surface of said jacket;

e. at least one compressible sealing member arranged on said sealing ring receiving seat to seal between said nut ring and said inner surface of said jacket;

f. a compression ring arranged for positioning against said nut ring for compression of said sealing member, said compression ring providing a plurality of circumferentially spaced passages therethrough;

g. certain of said passages being threaded for receiving threaded attachment elements into said compression ring;

h. certain of said compression ring passages providing accommodation and aperture, passing openings for threaded attachment elements to be threadedly received into said nut ring;

i. a plurality of threaded attachment elements received through said compression ring passages and into said nut

ring for compression of said sealing member and sealing thereof to said nut ring and said jacket;

j. a tapered surface being provided selectively on the respective ends of one of said roller body and said jacket;

k. a split ring member having a mating tapered surface thereon to mate with said selected body and jacket tapered surface;

l. said split ring member having a plurality of circumferentially spaced passages axially therethrough;

m. certain of said split ring passages being threaded;

n. certain of said split ring passages providing accomodation and attachment element openings for threaded attachment elements to be threadedly received in said nut ring;

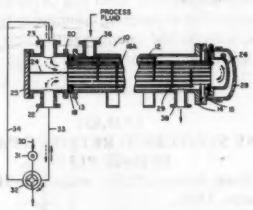
o. said threaded passages of said split ring being arranged in axial alignment with said accomodation openings of said compression ring and said accomodation openings of said split ring being in axial alignment with said threaded passages of said compression ring whereby succeeding the placement of and tightening of said compression ring to said nut ring for sealing compression of said sealing member, said split ring may be axially positioned with respect to said roller body and said jacket to provide an unitary structure.

4,545,426

REVERSING TURBULATORS FOR HEAT EXCHANGERS

John W. Collins, Beaumont, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,263
Int. Cl.[4] F28G *1/10;* **B08B** *9/04*
U.S. Cl. 165—95 **12 Claims**



6. In a tubular heat exchanger comprising a plurality of smooth-walled straight tubes of circular cross section each of said tubes being mounted on opposite ends through a tube sheet within a heat exchange shell, the improvement which comprises:

fluid handling means for pumping fluid reversibly through the interior of said tubes;

a plurality of longitudinally slidable turbulator devices for mounting in each of said tubes, each comprising a series of turbulator balls held within each of said tubes at longitudinally spaced points within said tubes, said balls permitting fluid flow around said balls adjacent the tube walls, each of said balls having a bore to permit a guideline to be stretched longitudinally therethrough;

guideline retention means mounted at opposite ends of each tube for passing a guideline through each tube while permitting fluid to flow at opposite ends of said tubes substantially unrestricted;

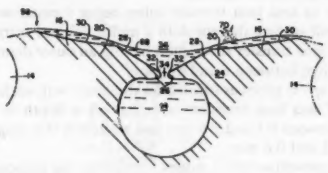
a plurality of guideline-mounted ball stopping means disposed at fixed points between said guideline retention means and each of said balls to permit each of said balls to travel between stopping means during fluid flow reversal.

4,545,427

RE-ENTRANT GROOVE HEAT PIPE

Joseph P. Alario, Hauppauge; Robert Kosson, Massapequa, and Edward Leszak, Amityville, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 381,336, May 24, 1982, Pat. No. 4,457,059.
This application Apr. 2, 1984, Ser. No. 596,107
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.26 **7 Claims**



1. A heat pipe, comprising

a wall formed from a single, relatively long section of tube enclosing a central channel; and

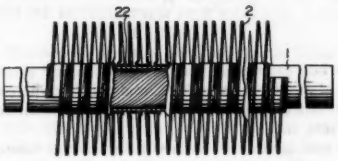
a plurality of axial ribs projecting inwardly from the wall toward the central channel, each rib having a base portion and relatively thicker head portion such that an adjacent pair of base portions defines a capillary channel and an adjacent pair of head portions defines a relatively narrow re-entrant groove opening, the head portion of each rib comprising a pair of oppositely projecting transverse fins each having a flat, sloping surface extending from an inner surface of the head portion to a tip of the transverse fin such that the tips of a facing pair of fins on an adjacent pair of ribs border an associated re-entrant groove opening and the flat, sloping surfaces of said facing pair of fins define a convergent entrance to the associated re-entrant groove opening, said tips of said facing pair of fins having an overall convex shape.

4,545,428

HEAT EXCHANGER FOR AIR CONDITIONING SYSTEM

Toshiya Onishi; Sasumu Oshima; Hiromi Mikata; Haruo Nakata, and Masami Horiuchi, all of Sakai, Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 452,149, Dec. 22, 1982, Pat. No. 4,480,684, which is a continuation of Ser. No. 129,463, Mar. 11, 1980, abandoned. This application Aug. 29, 1984, Ser. No. 645,255
Claims priority, application Japan, May 16, 1979, 54-65952
Int. Cl.[4] F25B *39/02, 39/04*
U.S. Cl. 165—110 **4 Claims**



1. A heat exchanger for an air conditioning system comprising:

a plurality of heat transfer tubes having their respective axes arranged substantially parallel to one another;

a multiplicity of spine fins secured to an outer surface of each of said heat transfer tubes and extending radially outwardly thereof;

a refrigerant flow passage defined inside each of said heat transfer tubes;

air passages each defined by the adjacent spine fins secured on the outer surface of each of said heat transfer tubes;

said spine fins being formed such that a multiplicity of parallel cuts are formed at small pitch in each of fin-base plates, except for their respective base portions, to form a multiplicity of legs, the respective base portions of said fin-base plates being wound around and secured to the outer surfaces of the respective heat transfer tubes so that said legs extend radially outwardly from said heat transfer tubes;

said spine fins being of a constructional form such that their coefficient of heat transfer to and from the air is over 1.2 times that of flat fins;

each of said heat transfer tubes being formed on the inner wall surface thereof with a multiplicity of spiral grooves;

said heat transfer tubes each having an outer diameter in the range between 6 and 16 mm;

said spiral grooves formed on the inner wall surface of each of said heat transfer tubes having a depth in the range between 0.1 and 0.6 mm and a pitch in the range between 0.2 and 0.6 mm;

the respective spiral ridges formed by the adjacent twos of said spiral grooves each having a sharp-apex, V-shaped cross-section and a vertical angle in the range between 50° and 100°;

the spiral grooves formed on the inner wall surface of each of said heat transfer tubes each having a helical angle with respect to the axis of the tube in the range between 16° and 35°; and

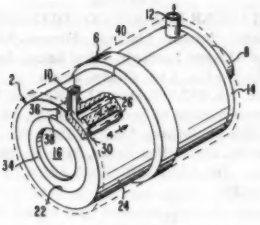
said heat exchanger being incorporated in a refrigerant circulating cycle of a heat-pump type so as to function selectively as a condenser and an evaporator therein.

4,545,429

WOVEN CERAMIC COMPOSITE HEAT EXCHANGER

Thomas M. Place, Jr., Costa Mesa, Calif., and James A. Crawford, Jr., Kennebunk, Me., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Jun. 28, 1982, Ser. No. 392,842
Int. Cl.[4] F28F *3/12*
U.S. Cl. 165—169 **7 Claims**



1. A heat exchanger comprising:

a solid portion surrounding a void portion; wherein the solid portion comprises a single woven fabric of interconnected fibers; and

the void portion comprises a network of interconnected generally cylindrical openings having diameters much greater than the separation between fibers in the fabric, the surfaces of the openings being integrally woven as part of the single woven fabric of interconnected fibers;

wherein the network is coupled to regions extrinsic to the exchanger via an input port penetrating one end of the exchanger, and via an output port penetrating an opposite end of the exchanger; and

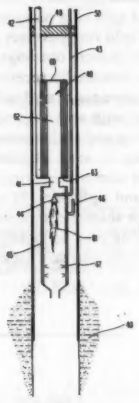
the network is disposed to permit a heat transfer fluid to travel through the input port into the exchanger, thence to travel out the output port out of the exchanger, and wherein the solid portion of the exchanger is fabricated of a ceramic composite material consisting of a single woven fabric of interconnected fibers impregnated with a matrix.

4,545,430

CATALYTIC COMBUSTOR HAVING SPIRAL SHAPE

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19380

Continuation-in-part of Ser. No. 412,295, Aug. 27, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 620,630
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—59 **12 Claims**



1. A catalytic combustor comprising a single sheet of metal, the sheet being coated with catalyst, the sheet being wound into a spiral, the combustor having first closure means at one end, the first closure means comprising means for preventing gas flow out of said end of the spiral, the combustor having second closure means at the other end of the spiral, the second closure means having an opening communicating with the core of the spiral, wherein the opening is the sole path for exit of combustion gas from the spiral.

4,545,431

WIRELINE SET/TUBING RETRIEVE PACKER TYPE BRIDGE PLUG

William M. Fore, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed May 23, 1984, Ser. No. 613,663
Int. Cl.[4] F21B *23/06*
U.S. Cl. 166—183 **20 Claims**

1. A retrievable well tool for use in well bores, said retrievable well tool comprising:

a mandrel having at least one shaped recess in one end thereof, a ratchet thread on a portion thereof, and a plurality of lugs on a portion of the exterior thereof;

a cap slidably disposed on the mandrel;

a packer mandrel having a portion thereof adapted to releasably engage the ratchet thread on the mandrel, the packer mandrel being disposed about the mandrel;

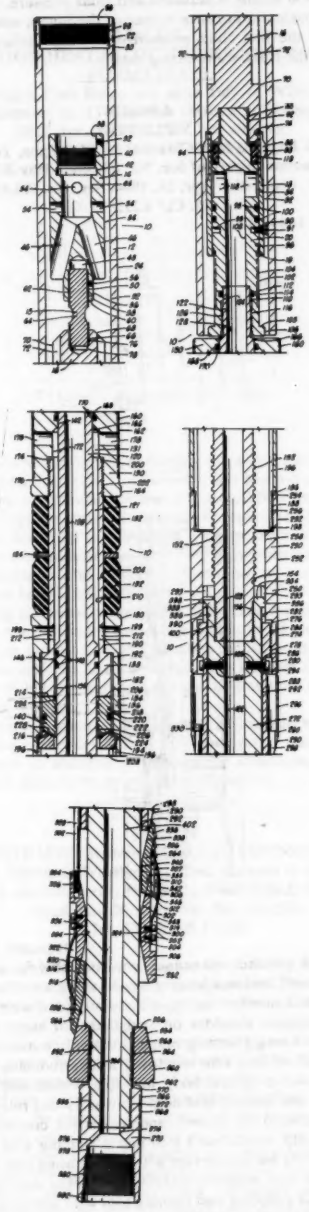
a packer element disposed about the packer mandrel, the packer element adapted to releasably, resiliently engage said well bore;

a packer mandrel case disposed about a portion of the packer mandrel and the mandrel;

an upper wedge member disposed about the mandrel and having a plurality of shaped recesses in one end thereof which releasably engage the plurality of lugs of the mandrel and a frusto-conical surface on a portion of the exterior thereof;

a lower wedge member disposed about the mandrel having a frusto-conical surface on a portion of the exterior thereof; and

a slip retainer disposed about the mandrel having a plurality of slips retained thereon, some of which slips slidably



engage the frusto-conical surface of the upper wedge member and some of which slips slidably engage the frusto-conical surface on the lower wedge member.

4,545,432

DEVICE FOR RETRIEVING OBJECTS FROM WELLS

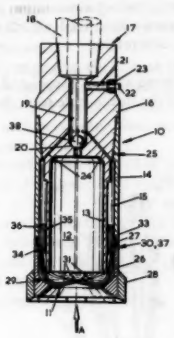
Robert P. Appleton, Glenburn House, Tornaveen, Nr. Torphins, Aberdeenshire, Scotland

Continuation of Ser. No. 558,167, Dec. 5, 1983, abandoned. This application Apr. 9, 1985, Ser. No. 721,313

Claims priority, application United Kingdom, Dec. 16, 1982, 8235836

Int. Cl.[4] **E21B** *31/08*

U.S. Cl. 166—99 **5 Claims**



1. A retrieving device for use in retrieving objects from wells, comprising a body of generally hollow cylindrical configuration, means defining an open end of said body giving access to the interior of said body, a head portion of said body disposed opposite the said open end, a hollow cylindrical wall extending from said head portion concentrically within said body and defining therewith an annular space, a sleeve member in said annular space, finger-like elements formed on said sleeve member and directed towards said open end, said finger-like elements being of a malleable material, said sleeve together with said finger-like elements being free to rotate with respect to said body, means for forcing the sleeve together with the finger-like elements towards said open end, and deflecting means within said body adjacent said open end for deflecting said finger-like elements inwards, a free end of said hollow cylindrical wall being disposed adjacent said deflecting means for cooperating with said deflecting means to effect permanent closure formation of the finger-like elements.

4,545,433

REINFORCING ELEMENT AND DEMAND SENSITIVE PRESSURE INTENSIFIER FOR SEALING A WELL CASING

John O. Wambaugh, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Oct. 24, 1983, Ser. No. 544,660

Int. Cl.[4] **E21B** *33/128, 33/129, 33/12*

U.S. Cl. 166—105 **22 Claims**

1. A reinforcing element for an elastomeric sealing element for use within a well casing and passable through production tubing, the diameter of the production tubing being smaller than the diameter of the well casing, comprising:

upper and lower metallic plate members, each plate member having: a center portion with an axial passageway extending therethrough and adapted for receipt of an elongate mandrel; and a plurality of radially extending projections having first and second ends, each first end being formed integral with the center portion;

each of the projections being bent downwardly to dispose each projection in a plane which is substantially perpendicular to the center portion of the plate member, the projections of the upper plate member disposed below the center portion of the upper plate member and the projections of the lower

plate member disposed above the center portion of the lower plate member; and

the second ends of at least two of the projections for each plate member being fixedly secured to second ends of corresponding projections of the other plate member, whereby the plate members form an elongate body which can pass through the projection tubing and upon exertion of a compressive force on the center portions, the projections are disposed in a plane substantially parallel to the center portion of each plate member.

8. A demand sensitive pressure intensifier for use with a hydraulic fluid pump, having a maximum output pressure, and associated with a down-hole tool which is passable through production tubing, comprising:

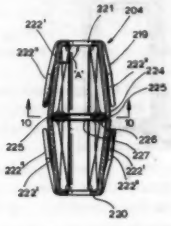
a first housing;

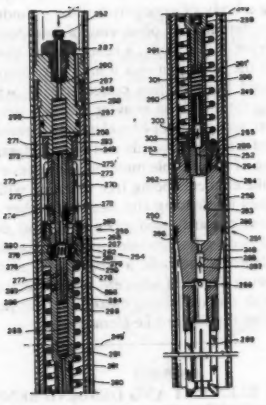
a means for transmitting a force, associated with the housing to move a portion of the down-hole tool, the force transmitting means having a first fluid pressure receiving surface associated therewith;

a first hydraulic fluid passageway extending through the housing and in fluid communication between the pump and the first fluid pressure receiving surface associated with the force transmitting means;

means for compressing hydraulic fluid disposed in the first hydraulic fluid passageway to increase the fluid pressure, exerted upon the first fluid pressure receiving surface associated with the force transmitting means, to a pressure which exceeds the maximum output pressure of the pump; and

means for selectively actuating the compression means when the output pressure of the pump reaches a predetermined pressure value below the maximum output pressure of the pump, the selective actuation means including: a second fluid pressure receiving surface associated therewith; and a second hydraulic fluid passageway in fluid communication with the pump and the second fluid pressure receiving surface, whereby upon fluid pressure, acting upon the second fluid pressure receiving surface associated with the selective actuation means, reaching a predetermined pressure value below the maximum output pressure of the pump, the compression means is actuated and fluid pressure, greater than the maximum pressure output of the pump, selectively acts upon the first fluid pressure receiving surface associated with the force transmitting means.





4,545,434

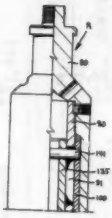
WELL TOOL

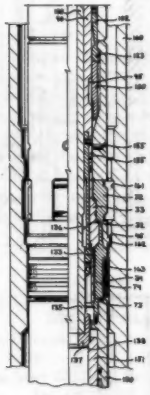
Brian D. Higgins, 1308 Cherokee St., Arlington, Tex. 76012

Continuation-in-part of Ser. No. 374,066, May 3, 1982. This application Apr. 24, 1984, Ser. No. 603,435

Int. Cl.[4] E21B *23/00*

U.S. Cl. 166—217 **26 Claims**





1. A lock mandrel and running tool assembly for setting and locking a well tool in a landing nipple along a well bore comprising a lock mandrel having a body provided with side windows, a support shoulder on said body for supporting said mandrel in a no-go landing nipple, a radially movable locking dog in each of said side windows, a longitudinally movable expander sleeve in said body movable within said dogs for expanding and locking said dogs outwardly and releasing said dogs for inward movement, and means for connecting said mandrel body to said well tool and a running tool having a head assembly for connection with an operating tool string, an upper latch key assembly slidably connected with said head assembly for coupling said running tool with said lock mandrel body, a lower latch assembly operable by said head assembly for coupling said running tool with and raising said lock mandrel expander sleeve, a core having a prong end coupled with said head assembly for engaging a well tool operator member to apply a force from said operator member to said upper latch key assembly to lock said key assembly with said lock mandrel body, and said head assembly and core being movable in a

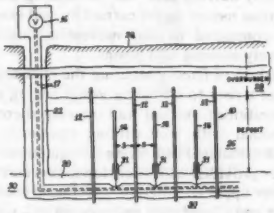
direction opposite to the direction of setting said assembly in said landing nipple to expand said lock mandrel locking dogs and release said running tool from said lock mandrel.

4,545,435

CONDUCTION HEATING OF HYDROCARBONACEOUS FORMATIONS

Jack E. Bridges, Park Ridge, and Allen Taflove, Wilmette, both of Ill., assignors to IIT Research Institute, Chicago, Ill.

Filed Apr. 29, 1983, Ser. No. 489,849
Int. Cl.⁴ E21B *43/24, 43/30*
U.S. Cl. 166—248 **12 Claims**



1. A method for the in situ heating of earth formations having substantial electrical conductivity, said method comprising

bounding a particular volume of a said earth formation with a waveguide structure formed of respective rows of discrete elongated electrodes in a dense array wherein the active electrode area and the row separation are chosen in reference to the formation thickness to avoid heating barren layers, and

applying electrical power at no more than a relatively low frequency between respective said rows of electrodes to deliver power to said formation while producing relatively uniform heating thereof and limiting the relative loss of heat to adjacent regions to less than a predetermined amount,

the electrode spacing and diameters limiting the temperature of said electrodes to near the vaporization point of water thereat to maintain an electrically conductive path between said electrodes and said formation.

4,545,436

CENTRALIZER BAND-COLLAR CONNECTION

James E. Harrison, Weatherford, Tex., assignor to Antelope Oil Tool & Manufacturing Company, Weatherford, Tex.

Filed Jan. 20, 1984, Ser. No. 572,558
Int. Cl.⁴ E21B *17/10*
U.S. Cl. 166—241 **1 Claim**

1. A centralizer for mounting on a well casing to function in the annular space between the casing and well bore, said centralizer having a pair of axially spaced collars slidably fitted to the exterior of the casing,

a plurality of outwardly bowed spring members spanning the space between the collars and substantially equally spaced circumferentially of said collars,

one of the ends of each said member attached to the upper collar, the opposite end thereof to the lower collar,

each said collar having upper and lower end edges of relatively lesser internal diameter, whereby to closely fit and engage the said casing with the upper and lower end edges thereof, said upper and lower end edges terminating at their uppermost and lowermost extensions in cylindrical, casing embracing portions thereof

the intermediate portion of each said collar between said end edges being of greater internal diameter than said upper and lower edges thereof, whereby to be spaced outwardly from said casing when said collars engage same,

the inboard, adjacent, relatively lesser internal diameter edges of said collars being relieved in a plurality of spaced portions thereof, whereby to receive portions of the ends of the spring members thereunder and therepast,

a plurality of normally horizontal slots formed through the collar portions of relatively greater internal diameter, one said slot positioned outboard of each of the collar relieved inboard portions,

each end of each spring member being of substantial U-shape in side view with two U legs separated by a U-base, whereby to simultaneously effect engagement of the outermost end of the member with said slot and the relieved portion of said collar with the inboard member U leg with the U base underlying the collar greater internal diameter portion therebetween,

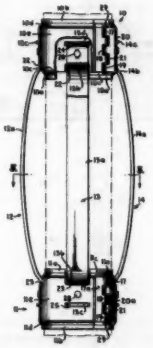
means for fixedly engaging the U base of each member with respect to the collar greater internal diameter portion between the slot and the collar relieved portion,

the said spring members being four in number and equally spaced from one another,

the said collars each being formed of two 180° arcuate sections, the ends of said sections hinged and latched to one another,

the greater internal diameter portion of each collar being substantially cylindrical in form whereby to form a substantially cylindrical boss with respect to upper and lower edges of said collar,

the greater internal diameter portions of the collars having



an internal clearance with respect to the cylindrical lesser internal diameter upper and lower edges of the collars at least equal to the thickness of the spring members and the height of a rivet head,

the means for fixedly engaging the U base of each spring member with a collar greater internal diameter portion comprising a rivet, said rivet having its head positioned radially inwardly of said collar portion and spring end base, there being matching openings through the collar and spring U-base, each of said openings being oversize with respect to the rivet shaft portion extending therethrough,

the relieved collar portions on the inboard, adjacent, relatively lesser internal diameter portions thereof also including a relief of a substantial portion of the greater internal diameter collar portions axially next thereto,

there being only two collar inboard edge lesser internal diameter portions, such being 180 degrees opposed to one another, as well as being 90° arcuately spaced from the opposed hinge and latch connections and two collar outboard edge lesser internal diameter portions, such also 180 degrees opposed to one another, the said collar inboard edge portions being of considerably lesser arcuate extent than such of the outboard edge portions and such being centered with respect to the said larger outboard edge portions,

the slots formed through the collar portions being of greater height than the thickness of the ends of the spring members received therewithin and

the means for fixedly engaging the U-base of each spring member with a collar greater internal diameter portion between the collar slot and the collar relieved portion comprising a rivet engaging matching openings therewithin, one such opening positioned within the U-base of the spring member and the other such opening positioned within the collar greater internal diameter portion between the slot and the collar relieved portion therein,

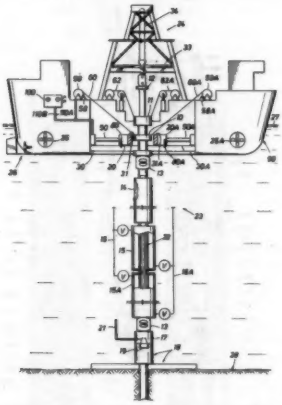
the opening in the spring member U-base being slotted axially of the centralizer, whereby working of the spring members with respect to the collars will cause the spring member ends to contact the collar slot edges without shearing the rivets, the collar opening itself oversize.

4,545,437

DRILLING RISER LOCKING APPARATUS AND METHOD

Early B. Denison, Houston, Tex., assignor to Shell Offshore Inc., Houston, Tex.

Filed Apr. 9, 1984, Ser. No. 597,994
Int. Cl.[4] E21B *19/09*
U.S. Cl. 166—345 **22 Claims**



1. For use in a floating vessel having a substantially centrally-positioned vertical hull opening therethrough, said vessel being provided with well drilling equipment, including an elongated vertical riser provided with riser stop means carried outwardly near upper end thereof, flexible coupling means in said riser below the stop means thereof and buoyancy adjusting means on the submerged portion of said riser, said riser extending in tension substantially centrally down thrugh said hull opening to a point adjacent the ocean floor, and motion-compensating and tensioning means carried by said vessel operatively connected to said riser for vertically supporting said riser during normal operations,

said improvement comprising auxiliary riser locking means apparatus carried by said vessel substantially within the plan view cross section of the hull opening through the vessel, said locking means apparatus comprising:

at least two track means arranged in spaced relationship on opposite sides of and within said hull opening, and being connected to said vessel,

at least a pair of moveable locking beams supported at each end by each of said track means and positioned to span opposite portions of said hull opening, and being moveable toward each other,

vertical movement-limiting means engageable with said locking beams and operatively connected to said vessel adjacent said track means to prevent vertical movement of said moveable locking beams away from said track means,

at least one landing area carried by each of said moveable locking beams, said landing areas being engageable with at least a portion of said riser stop means,

at least a pair of riser-positioning means, each one being operatively connected between said riser and said vessel, and being moveable relative to each other and to the landing areas of said moveable locking beams to selectively position said riser within said hull opening of said vessel,

first prime mover means carried by said vessel and operatively connected to said pair of riser positioning means for selectively moving said riser-positioning means, and

second prime mover means carried by said vessel and operatively connected to said moveable locking beams for selectively moving said beams.

17. A method of fixedly securing the elements forming the upper end of a riser to a floating vessel having a substantially centrally positioned vertical hull opening therethrough, said vessel provided with well drilling equipment, including a derrick with associated drill string lift equipment, an elongated vertical riser provided with riser stop means carried outwardly near said riser upper end thereof, a wellhead connector carried at the lower end of said riser and secured to a wellhead assembly, flexible coupling means in said riser below the stop means thereof, and adjustable buoyancy means formed with the submerged portion of said riser, said riser extending in tension during normal operations substantially centrally down through said hull opening to a point adjacent a wellhead assembly located adjacent the ocean floor, said vessel carrying motion-compensating and tensioning means operatively connected to said riser upper elements for vertically supporting said riser during normal operations, and provided with riser locking means apparatus including a pair of locking beams on tracks connected to said vessel;

said method comprising:

remotely disconnecting the wellhead connector at the lower end of said riser from said wellhead assembly;

actuating said riser positioning means, said floating vessel riser motion compensating and tensioning means, and said drill string lift equipment, thereby;

positioning riser stop means adjacent riser locking means apparatus,

moving said moveable locking beams along said track means toward each other, and

engaging said moveable locking beams with said riser stop means to prevent movement of riser upper elements relative to said floating vessel.

4,545,438

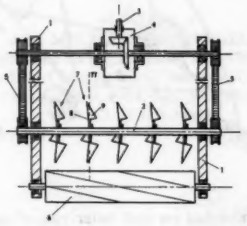
PLOWING IMPLEMENT PROVIDED WITH ROTARY TOOLS

Caltabiano Giovanni, via Anfossi n. 4, Padova, Italy

Filed Jan. 10, 1984, Ser. No. 569,668
Claims priority, application Italy, Jan. 28, 1983, 41512 A/83
Int. Cl.[4] A01B *33/02, 33/10*
U.S. Cl. 172—123 **3 Claims**

1. A plowing implement provided with rotary tools consisting of a powered horizontal rotor (2), mounted on a bearing frame (1) pulled by a vehicle, disposed transversely to the advancing direction of said vehicle and comprising a series of tool (9) sets (7) aligned thereon and suitably spaced apart from each other, each of them being provided with a plurality of curved radial arms (8) at the free ends of which said tools (9) are fixed, characterized in that each of said tools (9) consists of a substantially irregular, arcuated and pointed wedge-shaped body (9), which prevalently develops along the curvilinear direction of the free end of a corresponding arm (8) and which is of substantially triangular cross-section, said body (9) being forward provided, with respect to its sense of rotation, with a first curvilinear, concave edge (AD) acting as the main cutting

edge of the tool and lying in a plane inclined by an acute angle α with respect to the vertical lying plane (π) of said arm (8), said first edge (AD) forming the forward rim of at least a first face (ABD) of said body (9) which is concave and considerably slanting with respect to said vertical plane (π), has the form of a plowshare-moldboard and is adapted to carry out a sidewise turning over of the earth lump cut by said first edge (AD), said



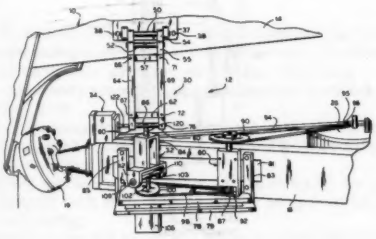
body (9) being further provided, backwards with respect to its sense of rotation, with a second rectilinear edge (BC) acting as an auxiliary cutting edge of the tool, which is inclined by an acute angle β with respect to said vertical plane (π), said second edge (BC) forming the back rim of a substantially flat second face (BCD) of said body (9) that acts as an auxiliary plowshare.

4,545,439

APPARATUS FOR DETERMINING THE TRUE CROSS SLOPE OF A BLADE

Andrew J. Sellett, 570 Sycamore Rd., LaSalle, Ill. 61301, and J. Michael Langham, 1920 Plum St., Peru, Ill. 61354

Filed Jul. 1, 1983, Ser. No. 510,272
Int. Cl.[4] E03F *3/76*
U.S. Cl. 172—430 **16 Claims**



12. An apparatus for determining the true cross slope of the blade of a translatable earth moving device having a main frame and a draw bar mounted on the main frame for movement relative thereto, said blade being mounted for rotational movement about a generally vertical axis on the draw bar, said true cross slope determining apparatus comprising:

first support means adapted to be mounted on the draw bar of an earth moving device for movement therewith,

first reference means mounted on the first support means for rotation about a first axis which is parallel to the axis about which the blade rotates on the draw bar when the first support means is mounted on the draw bar,

coupling means adapted to be coupled to the blade of the earth moving device and to the first reference means for rotating the first reference means about a first axis and through same angle as the blade is rotated relative to the draw bar so that the first reference means defines a line and space parallel to a line on the blade,

second support means adapted to be mounted on the main frame of the earth moving device and adapted to be oriented in the direction that the earth moving device translates,

second reference means mounted on the second support means for bidirectional movement in a first direction parallel to the direction in which the earth moving device translates and in a second direction perpendicular to the direction of translation,

coupling means having a first part pivotally coupled to said first reference means and a second part pivotally coupled to said second reference means,

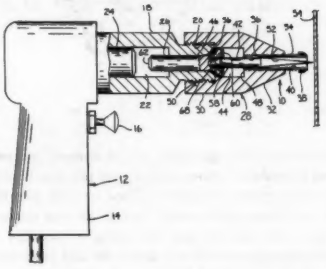
and a slope sensor coupled to said second reference means whereby said slope sensor defines the true cross slope of said blade.

4,545,440

ATTACHMENT FOR PNEUMATIC HAMMERS FOR PUNCHING HOLES OF VARYING SIZE

John E. Treadway, 10510 Crecelius Dr., St. Louis, Mo. 63123

Filed Apr. 7, 1983, Ser. No. 482,944
Int. Cl.[4] B21D *31/02*
U.S. Cl. 173—132 **8 Claims**



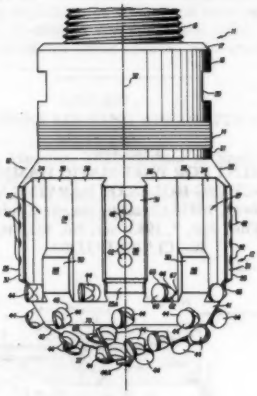
1. An attachment for pneumatic hammers having reciprocatory internal hammer like drive means for driving a tool such as a hammer, chisel or the like, said attachment comprising a housing having means for supporting a tapered punch and adjustment means for limiting the effective length of travel of the punch exteriorly of the housing to vary the hole size in a work surface in which a hole is to be punched, said housing having an internally threaded rear end removably receivable upon an externally threaded muzzle end of said hammer, said tapered punch having a fixed axial travel within said housing, the housing having an axial opening defined by a forward barrel opening closely receiving said punch and an enlarged chamber opening having a forward boundary shoulder serving as a stop for said punch, said chamber opening having an axial length limiting the fixed reciprocal travel of the punch and said adjustment means having an axially adjustable stop means engageable with the work surface to be punched to limit selectively the travel of the punch in front of said stop means, said adjustment means being a tubular member slidably receiving the tapered punch and the tubular member being supported within said forward barrel opening on a muzzle portion of the housing in engageable relation with said work surface and axially adjustable with respect to said housing and a punch holder for said punch, said punch holder being slidably receivable within said housing and having a rear anvil end portion engageable by the drive means of said hammer and a forward end portion within said enlarged chamber receiving a rear end of said punch.

4,545,441

DRILL BITS WITH POLYCRYSTALLINE DIAMOND CUTTING ELEMENTS MOUNTED ON SERRATED SUPPORTS PRESSED IN DRILL HEAD

Kirk E. Williamson, Corpus Christi, Tex.

Continuation-in-part of Ser. No. 237,971, Feb. 25, 1981, Pat. No. 4,429,755. This application Jan. 26, 1984, Ser. No. 574,167
The portion of the term of this patent subsequent to Feb. 7, 2001, has been disclaimed.
Int. Cl.[4] E21B *10/46*
U.S. Cl. 175—329 **27 Claims**



1. A drill bit for oil or gas wells which comprises a pin shank, a drill head threadably connected to said pin shank and a body spacer in compression which is affixed to said pin shank and said head, a cylindrical bit body having an end surface and a side surface, said side surface including a plurality of gage pads, each said gage pad affixed in part to said head and in part to said body spacer and fluid channels defined between said gage pads, a plurality of cutters mounted on said end surface, one said cutter disposed to rotate proximate the bit's axis of rotation, a first set of cutters disposed at a first equal radius from said axis and displaced through equal arcs around said axis, and further successive sets of cutters disposed further radii equal in each said set and being displaced from each other by equal arcs in each said set around said axis, said cutters tracing circular cutting paths around said axis which overlap and substantially cover the entire area of said end surface.

4,545,442

METHOD AND APPARATUS FOR FORMING A HEAT EXCHANGE SYSTEM IN THE EARTH

Bert J. Warner, and Joe F. Warner, both of 504 Towncreek Dr., Dallas, Tex. 75232

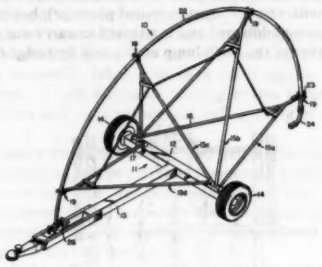
Division of Ser. No. 308,862, Oct. 5, 1981, Pat. No. 4,501,513. This application Dec. 10, 1984, Ser. No. 680,343
Int. Cl.[4] E21B *17/20, 19/08*
U.S. Cl. 175—220 **7 Claims**

1. Apparatus for forming a curved hole in the earth, said apparatus comprising:

a frame;

a plurality of supports, each of said supports having an inner end and an outer end;

means to pivotably mount said inner ends of each of said plurality of supports to said frame about a common axis so that when said supports are pivoted about said common axis, said outer ends of each of said plurality of supports will move along a common circular path having a radius substantially equal to that of said curved hole; and



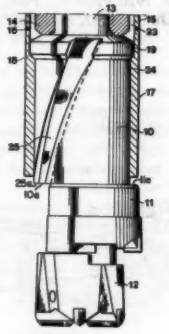
guide means mounted on said outer end of each support adapted to receive and support a drill pipe.

4,545,443

MEANS FOR DRILLING

Harry A. I. Wiredal, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sweden

Continuation of Ser. No. 899,170, Apr. 24, 1978,. This application Jun. 10, 1983, Ser. No. 493,059
Claims priority, application Sweden, Apr. 29, 1977, 7704972
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.[4] E21B *10/26, 1/02*
U.S. Cl. 175—258 **7 Claims**



1. Means for drilling of the type comprising a rotatable drilling tool adapted to drill a hole in advance of a trailing casing tube means which are moved by rotatable drill rod means, said casing tube means having a forward mouth portion with a cylindrical interior surface, said drill rod means and said casing tube means having an annular space therebetween, said drilling tool comprising a central bit, an eccentrically disposed reamer cutting edge means in axial proximity rearwardly of said bit and a cylindrical guide body in coaxial relation to said bit, the forward portion of said guide body having such a diameter as to provide sliding engagement with the interior cylindrical surface of said mouth portion of said casing tube means, said guide body having at least one rearwardly-extending recess in the cylindrical surface of its forward portion for the discharge of drilling debris rearwardly to said annular space provided between said rotatable drill rod means and said casing tube means, said recess being U-shaped in cross-section and the width of said recess exceeding the radial depth thereof, said drilling tool and said guide body being connected to a

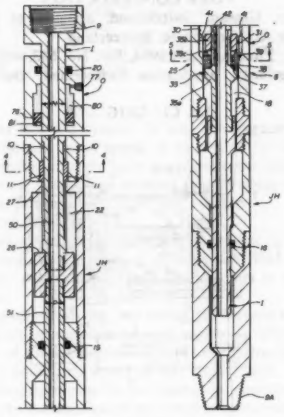
rotatable drill tube associated with a down-the-hole drilling machine and said casing tube having at its lower end a thickened mouth portion providing an upward annular driving shoulder for cooperation with a flange on said guide body for transmitting impacts to said casing tube, said at least one rearwardly extending recess extending along said forward portion of said guide body and also passing axially through said flange on said guide member.

4,545,444

JAR MECHANISM ENERGIZER

Derrel D. Webb, 802 Axilda, Houston, Tex. 77017, and Edwin A. Anderson, 1104 Chimney Rock, Houston, Tex. 77056

Filed Jan. 9, 1984, Ser. No. 569,269
Int. Cl.[4] E21B *31/113*
U.S. Cl. 175—296 **36 Claims**



1. A compressible medium assisted hydraulic jar arrangement for incorporating in a well string for ue in a well bore to deliver an upward jar to the well string, comprising:

an outer body adapted to be connected to a stuck fish in the well bore;

a hollow inner body for connecting with the well string and telescoped within said outer body and longitudinally movable relative thereto;

jarring surfaces on said inner and outer bodies for jarring contact with each other to deliver an upward jar to the well string;

spaced upper and lower seal means between said inner and outer bodies forming first chamber means for receiving an operating liquid;

longitudinally extending annular restriction means on said outer body within the first chamber;

piston means secured to and movable with said inner body within the first chamber;

said piston means including fluid meter means operable when said piston means is between the ends of said restriction means for restraining longitudinal movement of said inner body to an extended position relative to said outer body whereby a pull force may be developed in the well string and inner body, said fluid meter means operable after a predetermined relative longitudinal movement between said inner and outer body in response to the pull force in the well string and inner body to release said inner body for subsequent unrestrained longitudinal movement relative to said outer body until said jarring surfaces engage and deliver an upward jar to the well string;

additional spaced upper and lower seal means between said inner and outer bodies forming second chamber means for receiving a compressible medium therein; and

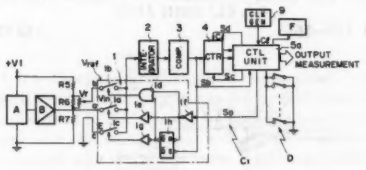
means forming a differential area on said inner body within the second chamber which compresses the compressible medium in the second chamber as the well string and inner body are lowered to telescope said inner body into said outer body for positioning said piston means in the first chamber to restrain movement between said inner and outer body to the extended position, and said differential area responsive to the compressible medium in the second chamber to exert an upward force on said inner body to assist in applying the upward jar to the well string when said inner body is released from said outer body by the pull force in the well string for unrestrained longitudinal movement therebetween.

4,545,445

SPAN ADJUSTING SYSTEM OF ELECTRONIC WEIGHING APPARATUS

Kazufumi Naito, Ohtsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Jul. 6, 1984, Ser. No. 628,305
Claims priority, application Japan, Jul. 7, 1983, 58-124508; Jul. 8, 1983, 58-125241; Jul. 11, 1983, 58-126585
Int. Cl.[4] G01G *23/22, 19/52, 23/14;* G01L *25/00*
U.S. Cl. 177—25 **11 Claims**



1. A system, for adjusting the span of an electronic scale, having a double-integrating A/D converter for converting a weight signal into a digital signal, said system comprising:

a control unit, operatively connected to the double-integrating A/D converter, having a software-implemented timer for controlling a primary integrating time of the double-integrating A/D converter; and

adjusting means, operatively connected to said control unit, for adjusting an operation time of said software-implemented timer.

4,545,446

HOPPER IN COMBINATORIAL WEIGHING APPARATUS

Rihei Kokabu, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

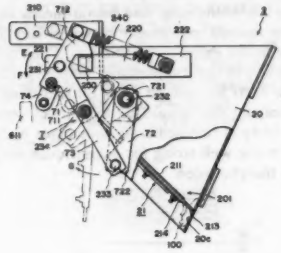
Filed May 11, 1984, Ser. No. 609,211
Claims priority, application Japan, May 11, 1983, 58-71062[U]; Mar. 30, 1984, 59-47445[U]
Int. Cl.[4] G01G *13/16, 13/34;* B65D *47/08;* B61D *7/18*
U.S. Cl. 177—108 **17 Claims**

1. A hopper in an automatic weighing apparatus, comprising:

a hopper body having an inner surface, a lower end and a discharge port at the lower end of the hopper body;

a gate, swingably supported on the hopper body, for opening and closing the discharge port, including

a base plate provided on the gate and formed smaller than the discharge port, and



a flexible sheet, affixed to the base plate, having an edge portion for resiliently contacting the inner surface of the hopper body in the discharge port.

4,545,447

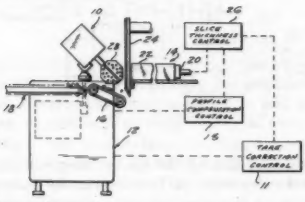
APPARATUS FOR STACKING AND WEIGHING SLICED FOOD PRODUCTS

Robert J. Spooner, and Oscar W. Dillon, both of Essex, Conn., assignors to Cashin Systems Corp., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 849,528, Nov. 7, 1977, abandoned. This application Nov. 6, 1979, Ser. No. 92,195

Int. Cl.⁴ G01G *13/14*

U.S. Cl. 177—165 **10 Claims**



1. In combination a slicing machine having a slicing blade, a feeding means for feeding a product to be sliced into said blade and control means for determining the rate of advance of said feeding means toward said blade, apparatus for stacking slices of said product as they are discharged by said slicing machine and then transferring the stacks of sliced product, weighing means operatively supporting said stacker such that it is adapted to register the weight of the sliced product being stacked thereon, stacker actuating means coupled with said stacker to transfer the stack of slices of said product and ready said stacker for reception of another stack of slices, slice counting means for determining a preselected number of slices discharged from the slicing machine for stacking on the stacker, stack receiving means and conveying means in stack receiving position adjacent said stacker and being adapted to receive thereon the stacks of sliced products transferred by said stacker, and tare correction control means associated with said weighing means to automatically operate in adjusting the weighing means to account for tare weight thereby facilitating the production of more uniform weight of stacks of sliced product, said tare correction control means includes: standard weight means for automatically dropping a standard weight on the scale each time the feeding means is being returned to the initial start position and is not feeding product into the blade; activation means for signaling the end of a slicing sequence and initiating the tare correction sequence; timing means indicating when the weighing means is cleared of the last stack and initiating the lowering of the standard weight onto the weighing means; second timing means for initiating the taking of a weight reading after a predetermined time delay and initiation of comparator means to compare the weight reading with a reference weight reading, upon detection of an error occurring from a difference in the two weight readings, the comparator actuates means for adjusting the weighing means to cancel out the error; and deactivation means responsive to full return of the feeding means to the initial position to disable the tare correction system and reset the slicing machine for the slicing and weighing operation.

4,545,448

WEIGHING APPARATUS INCLUDING IMPROVED YOKE CONSTRUCTION

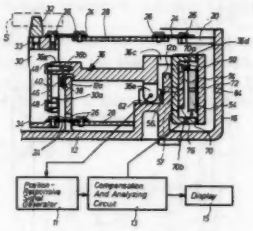
Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Aug. 24, 1984, Ser. No. 643,699

Claims priority, application Switzerland, Dec. 23, 1983, 6910/83

Int. Cl.⁴ G01G *7/00*

U.S. Cl. 177—212 **6 Claims**



1. In an electromagnetic load-compensation weighing apparatus of the type including a housing (**10**), means (**70,72,74**) defining a stationary magnetic field in said housing, a movable load support member (**30**) mounted in said housing, and load compensation means including position sensing means (**62**) connected with the housing for detecting displacement of the load support member from an initial no-load position, and a load compensation coil (**54**) connected with said member and arranged for displacement in the magnetic field, whereby compensation current supplied to the coil reacts with the field of the permanent magnet means to apply to the load support member a restoring force for displacing the load support member toward its initial no-load position;

the improvement wherein said means defining said stationary magnetic field comprises

(a) hollow ferromagnetic yoke means connected with said housing, said yoke means including a pair of U-shaped yoke members (**70,72**) arranged colinearly in opposed relation with the leg portions thereof extending toward each other, said yoke members being relatively angularly displaced about their longitudinal axes through 90° with the leg portions (**70a,70b**) of each yoke member (**70**) extending in parallel relation relative to the leg portions (**72a, 72b**) of the other yoke member (**72**) and terminating adjacent the base portion (**70c,72c**) of the other yoke member; and

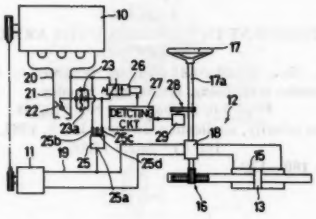
(b) permanent magnet means (**74,76**) secured within said yoke means for establishing a flux path therethrough;

(c) said load compensation coil being arranged within said yoke means and being connected with said load support member for movement within said stationary magnetic field.

4,545,449
POWER STEERING SYSTEM WITH ENGINE IDLING-UP MECHANISM

Hidetoshi Fujiwara, Okazaki, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 28, 1984, Ser. No. 655,459
Claims priority, application Japan, Sep. 30, 1983, 58-184233
Int. Cl.[4] B62D 5/06
U.S. Cl. 180—69.3 4 Claims



1. A power steering system for motor vehicles capable of controlling the rotational speed of an engine by varying the quantity of air-fuel mixture to be supplied to the engine from a fuel feed means, said power steering system comprising:

a hydraulic pump driven from said engine;

a power cylinder;

a servo valve mechanism driven from a steering wheel and controlling distribution of pressurized fluid from said hydraulic pump to a couple of chambers in said power cylinder;

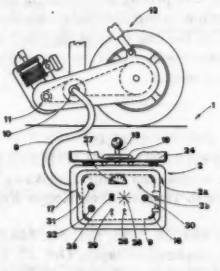
first idling-up means for increasing the quantity of air-fuel mixture to be supplied to said engine in response to increases of discharge pressure of said hydraulic pump to raise the rotational speed of said engine; and

second idling-up means for increasing the quantity of air-fuel mixture to be supplied to said engine to increase the rotational speed of said engine when a piston of said power piston reaches a position in a stroke end range.

4,545,450
MULTIPURPOSE EXTERNALLY CONTROLLED DEVICE

Giancarlo Mambelli, Viale Bologna, Italy, assignor to Motomec S.r.l., Longiano, Italy

Filed Dec. 13, 1983, Ser. No. 560,805
Claims priority, application Italy, Dec. 17, 1982, 5158/82[U]
Int. Cl.[4] B62K 15/00
U.S. Cl. 180—53.1 3 Claims

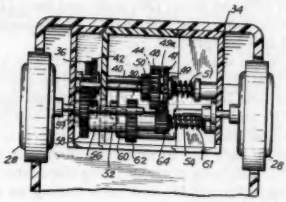


1. Multipurpose externally controlled member device comprising, in one single transportable casing, at least one generator, a compressor and a pump, the mechanical energy required for the operation of the device being supplied by an end of a single flexible shaft, coupling means in said casing engageable with at least one of said members, and control means on said casing for controlling the operation of said coupling means, the other end of said shaft being adapted for connection to an external power takeoff fitted to an engine assembly of a light motorbike.

4,545,451
TOY VEHICLE WITH AN AUTOMATIC TRANSMISSION

William J. Pipa, New Hyde Park, N.Y., and Leslie D. Turbowitz, West Orange, N.J., assignors to Azrak-Hamway International, Inc., New York, N.Y.

Filed Jul. 23, 1984, Ser. No. 633,700
Int. Cl.[4] B60K 17/00; F16H 5/52
U.S. Cl. 180—70.1 5 Claims

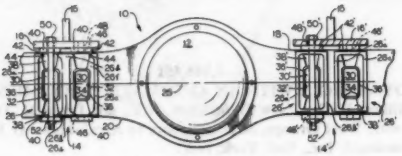


1. A toy vehicle with an automatic transmission comprising a chassis, four wheels rotatably mounted to said chassis, motor means mounted to said chassis, transmission means drivingly engaged with said motor means and activation means electrically engaged with said motor means, said transmission means comprising gear means operatively engaged with said motor means, an intermediate shaft drivingly engaged with said gear means comprising a shaft, a low speed driving gear and a high speed driving gear mounted on said shaft, said high speed driving gear including a first parallel gear fixed to said shaft, coaxially mounted with said low speed driving gear and formed with cavities in one side, a second parallel gear identical in diameter to said first parallel gear, rotatably mounted on said shaft and formed with protrusions on the side of said second parallel gear facing the cavities of said first parallel gear such that the protrusions of said second parallel gear align with the cavities in said first parallel gear, and first spring means biasing said second parallel gear toward said first parallel gear, and clutch shaft means including a rotatably mounted clutch shaft, a first clutch member operatively engaged with a least one of said wheels, a second clutch member shiftably mounted on said clutch shaft and formed with a low speed driven gear and a high speed driven gear and second spring means adapted to bias said second clutch member into engagement with said first clutch member so that said high speed driving gear is operatively engaged with said high speed driven gear to drive said vehicle at high speed with the movement of said toy vehicle is along flat terrain, said second clutch member adapted to axially shift along said clutch shaft in both the forward and reverse directions when a tortional force is exerted on said first clutch member resulting from the operation of said toy vehicle on adverse terrain causing said high speed driven gear to disengage from said gear means and causing said low speed driven gear to engage said low speed driving gear to drive said toy vehicle at low speed, said first and second parallel gears of said high speed driving gear adapted to allow said high speed driven gear to disengage from said high speed driving gear while said low speed driven gear is simultaneously engaging said low speed driving gear.

4,545,452
AXLE HOUSING MOUNTING BRACKET

Rodger L. Moring, Bristol, and Brent E. Rieke, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 26, 1983, Ser. No. 535,526
Int. Cl.[4] B20B *35/00*
U.S. Cl. 180—88 14 Claims



14. A mounting structure (14,14') for a flexible beam (10) having upper (18) and lower (20) walls and front (22) and rear (24) sides interconnecting the walls (18,20), said mounting structure (14,14') comprising:

a pair of column structures (26,26') each of which has a body portion (26*f*,26*f'*), a pair of transversely separated column elements (26*a*,26*b*,26*a'*,26*b'*) joined to said body portion (26*f*,26*f'*), and a pair of vertically separated webs (26*d*,26*e*,26*d'*,26*e'*) each of which is joined to said body portion (26*f*,26*f'*) and to said column elements (26*a*,26*b*,-26*a'*,26*b'*), said body portions being disposable adjacently said beam sides (22,24) and each having an attachment opening (30,30') therethrough;

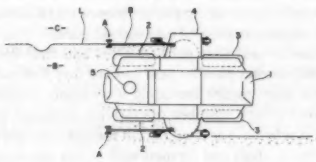
a pair of stiffening plates (40,40') each of which is engageable with one of the beam walls (18,20) and is attached to said column structures (26,26'); and

an endless weld seam (36,36') disposed in each of said attachment openings (30,30') for joining said column structures (26,26') to the beam sides (22,24).

4,545,453
AUTOMATIC RUNNING WORK VEHICLE

Shingo Yoshimura, Sakai; Katsumi Ito, and Shigeru Tanaka, both of Osaka, all of Japan, assignors to Kubota, Ltd., Japan

Filed Nov. 16, 1983, Ser. No. 552,436
Claims priority, application Japan, Jun. 28, 1983, 58-118743
Int. Cl.[4] B62D *5/00*
U.S. Cl. 180—131 11 Claims



7. An automatic running work vehicle adapted to automatically run along a predetermined boundary, comprising

follower sensor means (A) for detecting whether the vehicle is running along the boundary or deviating sideways therefrom and transmitting detection signals,

orientation sensor means (5) for detecting orientation of the vehicle,

comparator means connected to the orientation sensor means for comparing an orientation (Ψ) detected by the orientation sensor means (5) with a reference orientation (Ψ_0) and deriving an orientation difference ($\Delta\Psi$) therebetween, and

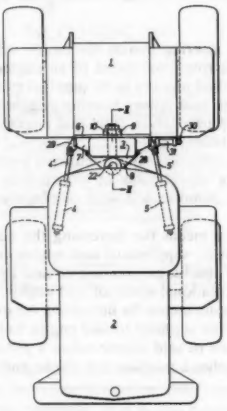
steering control means connected to the follower sensor means (A) and the comparator means and operable to steer the vehicle by follower control in response to the signals from the follower sensor means (A) and by orientation control in response to signals from the comparator means,

wherein the vehicle is steered by the follower control when the orientation difference ($\Delta\Psi$) is equal to and less than a predetermined value ($\Delta\Psi_1$) and by the orientation control, until the orientation difference becomes a preset value ($\Delta\Psi_2$), when the orientation difference ($\nabla\Psi$) exceeds the predetermined value ($\nabla\Psi_1$).

4,545,454
ARRANGEMENT IN VEHICLES WITH ARTICULATED STEERING

Olov A. Bas, Hudiksvall, Sweden, assignor to Hudiksvalls Mekaniska Aktiebolag, Hudiksvall, Sweden

Filed Jul. 5, 1983, Ser. No. 510,758
Claims priority, application Sweden, Jul. 9, 1982, 8204262
Int. Cl.[4] B62D *15/00*
U.S. Cl. 180—139 5 Claims



1. An arrangement for pivotally coupling two vehicle parts forming an articulated vehicle, which comprises a joint means including an intermediate part, two connections mounting the intermediate part on one of the vehicle parts for pivoting relative to the one vehicle part, the connections being spaced from each other in a vertical direction, and a steering hinge connecting the intermediate part to the other vehicle part, one of the connections comprising a journalling pin mounting and the other connection comprising a mounting means fixedly arranged relative to the one vehicle part and a gliding device arranged on the intermediate part for releasably coacting with the fixed mounting means.

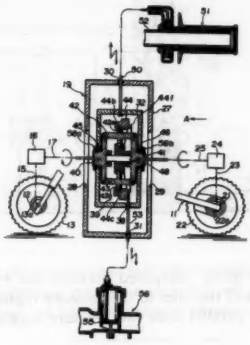
4,545,455
ANTI-SLIP APPARATUS FOR WHEELED VEHICLE

Shinji Kanemura, Asaka, and Shoji Tachikawa, Iruma, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,575
Claims priority, application Japan, Oct. 27, 1982, 57-188674; Nov. 2, 1982, 57-192810; Nov. 5, 1982, 57-194434
Int. Cl.[4] B60K *31/00*
U.S. Cl. 180—197 7 Claims

1. A anti-slip apparatus for a wheeled vehicle having a drive wheel, a driven wheel, an engine, a fuel control means for controlling a supply of fuel-air mixture to the engine, and an accelerator means operatively connected to the fuel control means by an operating wire, said apparatus comprising:

(a) a drive wheel speed sensor for sensing a rotational speed of the drive wheel;
(b) a driven wheel speed sensor for sensing a rotational speed of the driven wheel; and



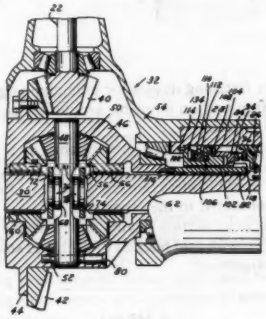
(c) a wire control means operatively connected to said drive and driven wheel speed sensors and operable to activate the operating wire to reduce the supply of fuel-air mixture from the fuel control means to the engine when the ratio of the rotational speed of the drive wheel to the rotational speed of the driven wheel exceeds a predetermined level.

4,545,456

FOUR-WHEEL DRIVE AXLESHAFT CLUTCH MECHANISM

William R. Lake, Lathrup Village, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 12, 1983, Ser. No. 531,306
Int. Cl.⁴ B60K *17/34, 23/08*
U.S. Cl. 180—233 **7 Claims**



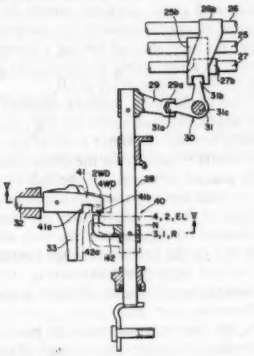
7. A system for selectively transmitting power between a power source and a first set of wheels comprising:
a driveshaft;
means for selectively connecting the power source and the driveshaft;
first and second axleshafts, each driveably connected to one of the wheels of the first set;
a first differential mechanism, the mechanism including a casing mounted for rotation and driveably connected to the driveshaft, a stub shaft mounted on the casing carrying bevel pinions, side bevel gears meshing with the bevel pinions, one bevel gear connected to the first axleshaft, a second bevel gear connected to an output shaft; and
clutching means for driveably connecting the second axleshaft to the output shaft including a cam follower connected to the differential casing and mounted for rotation therewith, a cam surface on which the cam follower moves adapted to produce axial movement of the cam follower as the differential casing rotates, means for driveably connecting and disconnecting the second axleshaft and the output shaft as the position of the cam follower varies.

4,545,457

GEAR SHIFTING APPARATUS OF A TRANSMISSION FOR A FOUR-WHEEL DRIVE VEHICLE

Seiichi Iwata, Mizuhomachi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 440,131
Claims priority, application Japan, Nov. 13, 1981, 56-182457
Int. Cl.⁴ B60K *23/08, 41/22;* **G05G** *5/10*
U.S. Cl. 180—247 **2 Claims**



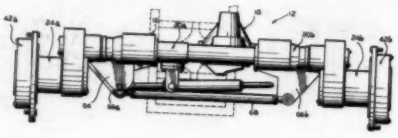
1. A gear shifting apparatus of a transmission for a four-wheel drive vehicle having two sets of driving wheels, comprising:
a final reduction device for transmitting the output of said transmission to one of said two sets of driving wheels:
a clutch for transmitting the output of said transmission to the other set of driving wheels;
an extra low speed gear provided in said transmission and having a reduction gear ratio higher than that of a first speed gear of said transmission;
first means for engaging said extra low speed gear;
second means for engaging said clutch for four-wheel driving;
a lock device operatively connected to said first and second means for selectively locking said means so that engagement of said extra low speed gear by said first means occurs only during engagement of said clutch by said second means,
said lock device comprises an engaging arm secured to said first means and an engaging projection formed at said second means, said engaging projection has a locking portion which obstructs movement of said engaging arm so as to prevent said first means from engaging said extra low speed gear,
said first means and said second means are substantially oriented perpendicularly to each other.

4,545,458

DRIVE MECHANISM FOR STEERING WHEELS OF VEHICLE

Donald D. Jones, Elwood, Ill., assignor to Trac 4 Inc., Elwood, Ill.

Filed Jul. 25, 1983, Ser. No. 517,223
Int. Cl.[4] B62D *7/10*
U.S. Cl. 180—255 **10 Claims**



1. A drive mechanism for the steering wheels of a vehicle, comprising:

a housing adapted to be mounted on the frame of the vehicle;

a differential gear in the housing adapted to be operatively connected to the drive shaft of the vehicle;

a pair of half shafts in the housing operatively connected to the differential gear, the half shafts extending outwardly from the differential gear in opposite directions and having inner and outer portions joined for relative pivotal movement at approximately the midpoints thereof with the inner portions thereof having a common axis, the half shaft inner portions being adapted to lie generally perpendicular to the vehicle drive shaft;

a pair of stub shafts in the housing operatively connected to the half shafts, the stub shafts having outer ends extending outwardly beyond the outer ends of the outer portions of the half shafts remote from the differential gear and being laterally spaced forwardly of the half shaft outer portions with the inner ends of the stub shafts being joined to the outer ends of the half shaft outer portions to form generally Z-shaped configurations, the stub shafts lying generally parallel to the half shaft outer portions;

a pair of wheel hubs for the steering wheels operatively connected to the outer ends of the stub shafts remote from the differential gear; and

means for accommodating relative pivotal movement at approximately the midpoints of the half shafts between the Z-shaped configurations and the inner portions of the half shafts;

whereby the vehicle may be steered while being driven with the drive mechanism such that the steering wheel on the outside of the turn advances forward in an arc while the steering wheel on the inside of the turn advances rearward in an arc during a turning maneuver.

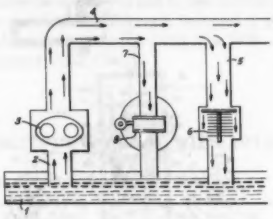
4,545,459

PROTECTIVE MEANS FOR NEUTRALIZING THE OPERATION OF A MOTOR VEHICLE HAVING AUTOMATIC TRANSMISSION

Tzur Rochman, 53 Hachashomonaim St., Tel Aviv, Israel (65273)

Continuation-in-part of Ser. No. 272,578, Jun. 11, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 557,902
Int. Cl.[4] B60R *25/06*
U.S. Cl. 180—287 **3 Claims**

1. An all mechanically operated device for preventing the theft of motor vehicles having automatic transmission gears and having a main transmission oil line provided between the pressure outlet of a transmission oil pump and the automatic transmission gears for supplying transmission oil under pressure to the automatic transmission gears; said device comprising a branch transmission oil line connected between said main line and a transmission oil sump, a selectively operated bypass valve connected in said branch line so that when said bypass valve is open, the transmission oil pressure to the automatic gears is neutralized thereby preventing transmission drive for the motor vehicle, and a pressure regulator valve connected between the main transmission oil line and the oil sump for controlling the transmission oil pressure supplied to the automatic gears with the branch line and the selectively operated



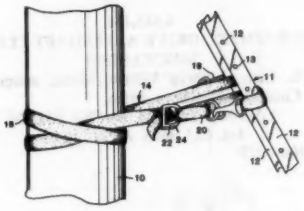
bypass valve being interposed between the transmission oil pump outlet and the inlet to the pressure regulator valve and connected in parallel with the pressure regulator valve and pump.

4,545,460

LADDER FASTENING DEVICE FOR POLE CLIMBING

James L. Byrd, 9320 N. Morrish Rd., Montrose, Mich. 48457

Filed Oct. 22, 1984, Ser. No. 663,435
Int. Cl.[4] E06C *7/48*
U.S. Cl. 182—107 **5 Claims**



1. A ladder fastening device for pole climbing, comprising:

a central strap portion wrapable around the pole and having free end portions;

a pair of end straps, each connectable to a different end portion of said central strap portion, each end strap having a pair of rigid buckles connected to one end and a latching means connected to the other end;

said central strap portion having its respective end portions engageable with said buckles of each end strap for overall length adjustment.

4,545,461

ADAPTOR FOR CONNECTING A GREASE GUN TO FLEXIBLE DRIVE CABLES FOR LUBRICATION PURPOSES

Milo Dewyer, 6701 W. Carol Ann Way, Peoria, Ariz. 85345

Filed Jan. 9, 1984, Ser. No. 569,291
Int. Cl.[4] F16N *1/00, 13/08*
U.S. Cl. 184—15.1 **2 Claims**

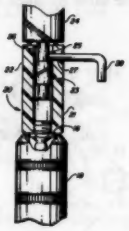
1. An adaptor for connecting a grease gun to speedometer, odometer, cruise control cables or the like for lubrication purposes comprising:

an elongated hollow cylindrical section,

means for detachably connecting one end of said section to a cable to be greased,

a grease fitting sealingly mounted in the other end of said section and adapted for receiving in a snap on manner the nozzle end of a grease gun,

said one end of said section being provided with an opening extending laterally thereof into the hollow interior of said section for receiving a locking pin and



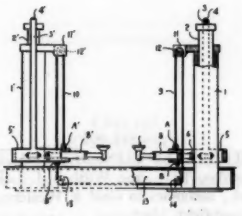
a locking pin for insertion into said opening for engaging in an interference manner a terminal end of an associated cable inserted into said one end of said section.

4,545,462

LIFT FOR VEHICLE MAINTENANCE

Yun T. Sul, 465-4 Taemyong-dong, Nam-ku, Taegu City, Rep. of Korea

Filed Jun. 22, 1983, Ser. No. 506,835
Int. Cl.⁴ B60S *13/00*
U.S. Cl. 187—8.41 **6 Claims**



1. A lifting device comprising:

two hydraulic cylinders each including a piston means reciprocally movable therein;

each of said piston means having respective lifting arm means operatively associated therewith for engaging an object to be lifted;

cable means extending and operatively associated with said respective lifting arm means for balancing the movement of said piston means;

a lifting arm support means associated with each of said lifting arm means and operatively associated with said piston means;

a guide arm means extending downwardly from said respective lifting arm support means and having wheel means associated therewith, said wheel means being in rolling contact with a guide means; and

pulley means positioned adjacent to said cylinder and between said lifting arm support means and said wheel means;

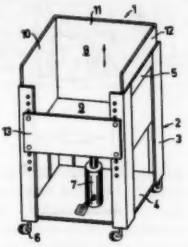
said cable means being secured to said lifting arm support means associated with a first one of said cylinders, extends over one of said pulley means positioned adjacent to said first one of said cylinders, extends to and over a pulley means positioned adjacent to a second one of said cylinders, and extends to and is secured to said lifting arm support means associated with the second one of said cylinders.

4,545,463

VERTICALLY ADJUSTABLE PICKING BOX

Gunnar Olovsson, 7, Matojärvigatan, S-981 00 Kiruna, Sweden

PCT No. PCT/SE82/00316, § 371 Date Jun. 6, 1983, § 102(e) Date Jun. 6, 1983, PCT Pub. No. WO83/01221, PCT Pub. Date Apr. 14, 1983
PCT Filed Oct. 5, 1982, Ser. No. 501,207
Claims priority, application Sweden, Oct. 6, 1981, 8105890
Int. Cl.⁴ B66B *9/20*
U.S. Cl. 187—9 R **6 Claims**



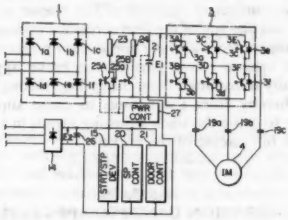
1. A liftable and lowerable box (1) for storing workpieces at a workplace, which box comprises a stand (2), which may be wheeled, with a vertically operating lifting and lowering device (7) for an upwardly open container (8), which container consists of a bottom (9) and sidewalls about the bottom and is guided by the stand or by the lifting and lowering device, characterized in that at least one sidewall is connected to the bottom of the container and that another sidewall is removably and non-pivotally connected to the stand at one of a plurality of pre-determined levels.

4,545,464

APPARATUS FOR CONTROLLING AN A-C POWER ELEVATOR

Masami Nomura, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 1, 1983, Ser. No. 470,955
Claims priority, application Japan, Mar. 9, 1982, 57-37065
Int. Cl.⁴ B66B *5/00*
U.S. Cl. 187—29 R **10 Claims**



1. An apparatus for controlling an A-C powered elevator comprising a rectifier for converting A-C electric power to D-C electric power, an inverter connected to the rectifier for converting the D-C electric power to A-C electric power of a variable frequency, a cage, an A-C electric motor operatively associated with the cage and connected to the inverter to be driven by the variable frequency A-C electric power, the motor producing regenerated electric power depending on the operation conditions of the cage, means for controlling the A-C electric motor, a D-C source connected to the motor controlling means, and a regenerated electric power controlling device connected between the D-C side of the inverter and

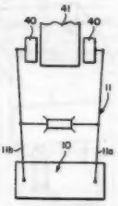
the motor controlling means in order to supply the regenerated electric power to the motor controlling means.

4,545,465

ACTUATORS FOR DISC BRAKE CALIPERS

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 14, 1984, Ser. No. 589,367
Int. Cl.[4] F16D *59/02*
U.S. Cl. 188—72.3 **7 Claims**



1. An actuator for a disc brake caliper comprising a cylindrical housing containing caliper actuating means having a piston subject to axial actuation in one direction by release of pressure of coaxial springs to actuate the disc brake caliper to a brake application position, the piston being subject to actuation in the opposite direction to compress the springs to actuate the caliper to a release position, threaded slack adjusting means coaxial with the piston for adjustably connecting the piston to the caliper comprising a rotatable lead screw coaxial with the piston threaded within a non-rotatable nut and operably connected to the piston through friction clutch connection means at one end of the lead screw, and manual release means for permitting actuation of the caliper from an application position to a release position, wherein improved manual release means comprises:

(a) means for securing the piston against rotation,

(b) manual release means including a release screw coaxial with the lead screw and extending outside of the housing at one end, and having its other end normally spaced a small distance away from said one end of the lead screw for manually releasing a brake application,

(c) the release screw being threaded through a portion of the non-rotatable piston, and

(d) means subject to rotation of the release screw to bear upon said one end of the lead screw for manually releasing the calipers from a brake application position by shifting to the release screw part of the brake applying force normally transmitted from the springs through the clutch, and thereby from the springs to cause slippage in the clutch to drive the slack adjusting means in a direction to permit full release of the brakes.

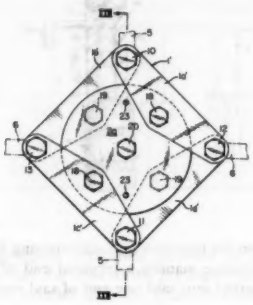
4,545,466

VIBRATION DAMPING APPARATUS

Jiro Izeki, Tokyo, and Ikuo Shimoda, Fujisawa, both of Japan, assignors to Oiles Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 352,600, Feb. 26, 1982, Pat. No. 4,480,731.
This application May 21, 1984, Ser. No. 612,645
Claims priority, application Japan, Feb. 27, 1981, 56-27731; Mar. 20, 1981, 56-39612; Apr. 16, 1981, 56-57716
Int. Cl.[4] F16D *57/02*
U.S. Cl. 188—268 **6 Claims**

1. A vibration damping apparatus comprising at least two rotatable members disposed opposite to each other while defining a gap therebetween so as to be rotatable relative to each other around substantially a single axis of rotation, four link bars pivoted to each other at their both ends by pins so as to constitute a quadric crank mechanism capable of turning around the axes of the pins, and a resistive body disposed in the gap between said rotatable members, the two link bars disposed opposite to each other among said four link bars being coupled at their middle points to the corresponding points of one of said rotatable members respectively, which points are spaced apart by the same distance from the axis of rotation of



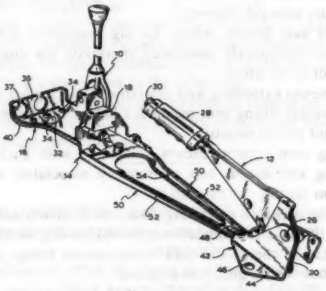
said rotatable member, the remaining two link bars disposed opposite to each other being coupled at their middle points to the corresponding points of the other of said rotatable members respectively, which points are spaced apart by the same distance from the axis of rotation of said the other rotatable member.

4,545,467

INTEGRATED CONSOLE BRACKET

John E. Fernandez, Troy, and William J. LaRocca, Warren, both of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Apr. 27, 1983, Ser. No. 488,905
Int. Cl.[4] B60K *41/26, 20/04*
U.S. Cl. 192—4 A **10 Claims**



1. An integrated console bracket assembly comprising:

an integral bracket having a front end, a rear end, and an intermediate portion including a pair of connecting members separated by a space therebetween, said intermediate portion connecting said front end and said rear end;

a shifter mechanism mounted to said front end of said integral bracket, and

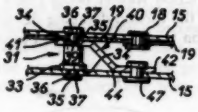
a parking brake mechanism mounted to said rear end of said bracket.

4,545,468

TORSION DAMPING ASSEMBLIES FOR CLUTCH DISCS

André Caray, Valence, France, assignor to Valeo, Paris, France

Filed Jun. 7, 1983, Ser. No. 501,822
Claims priority, application France, Jun. 8, 1982, 82 09934
Int. Cl.[4] F16D 3/66
U.S. Cl. 192—106.2 16 Claims



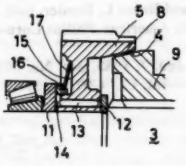
1. A torsion damping assembly comprising two coaxial parts mounted for relative angular displacement within a predetermined range against the action of circumferentially acting resilient means, one of said coaxial parts comprising a transverse hub flange and the other of said coaxial parts comprising two transverse annular guide members disposed on the respective sides of and spaced axially from said hub flange, axial connecting members interconnecting said guide members to each other, a strap member also interconnecting said guide members, a first end of said strap member being fixed to one of said guide and a second end of said strap member circumferentially spaced from said first end and fixed to the other of said guide members.

4,545,469

CONE CLUTCH

Yoshihiro Yogome; Yuuji Kobashi, and Kazuyoshi Shinada, all of Osaka, Japan, assignors to Yanmar Diesel Engine Co., Ltd., Osaka, Japan

Filed May 25, 1984, Ser. No. 614,228
Claims priority, application Japan, May 31, 1983, 58-83456[U]
Int. Cl.[4] F16D 11/04
U.S. Cl. 192—51 6 Claims



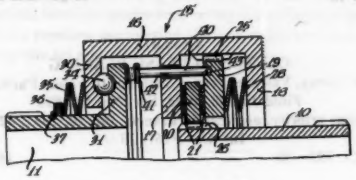
1. A cone clutch comprising an axially fixed rotatable shaft; a cone body connected to the rotation shaft through a helical spline and provided at an outer peripheral section with a pair of conical faces providing a frictional engagement surface; operating means for axially shifting said cone body; a pair of cone cups disposed on both sides of the cone body and being rotatable and axially slidable on the rotatable shaft; a pair of conical friction facings provided on said cone cups and being operable to frictionally engage with the conical facings of said cone body; rotational force transmitting means for transmitting rotational force in opposite directions of the cone cups; spring means disposed on a side of the cone cups opposite said conical face for forcing the cone cups toward the cone body.

4,545,470

NARROW TOLERANCE RANGE SLIP CLUTCH

Duane H. Grimm, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 14, 1983, Ser. No. 560,906
Int. Cl.[4] F16D 43/20
U.S. Cl. 192—56 R 17 Claims



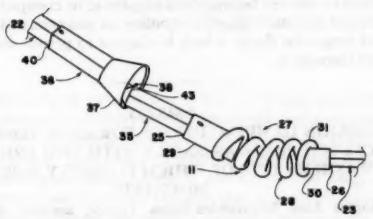
13. A narrow torque tolerance range slip clutch for establishing a drive connection between aligned input and output shafts comprising: a friction clutch having interfitted clutch members with at least two clutch members operatively connected one to each of the input and output shafts; a ball ramp mechanism including a pair of facing discs with opposed ball ramps in which a ball is positioned and which are caused to move apart as the ball leaves a centered position in the ball ramps; spring means acting to urge said ball ramp discs toward each other and to exert a compressive force on said interfitted clutch members.

4,545,471

DRIVE ASSEMBLY

Terry L. Danelson, Box 154 R33, and Barry J. Harmon, Box 965, both of Scobey, Mont. 59623

Continuation-in-part of Ser. No. 386,014, Jun. 7, 1982. This application Jul. 18, 1983, Ser. No. 514,317
Int. Cl.[4] A01B 39/19; F16D 11/00
U.S. Cl. 192—67 R 3 Claims



1. A separable drive assembly including first and second shaft sections, said shaft sections being normally aligned axially in an end to end relationship and being pivotally separable from one another, a coupling portion selectively operatively connecting adjacent ends of said first and second shaft sections, said coupling portion including a guide section including an axial bore therethrough, said adjacent end of said first shaft section engaging and being affixed within one end of said axial bore, said guide section including an enlarged generally conical end section at an opposite end of said axial bore from said first shaft section, an adjacent end of said second shaft section being capable of slidable engagement with said conical end section and said axial bore within said guide section, said axial bore adjacent said conical section having a cross section with a plurality of sides substantially the same as the cross-sectional configuration of said second shaft section but slightly larger to fix said second shaft section against rotation with respect to said coupling portion, a connector portion disposed along the length of said second shaft section adjacent said coupling portion, said connector portion including a resilient section

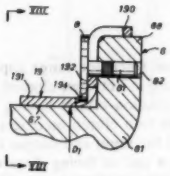
including a coil spring and end sections with axial openings in which ends of said second shaft section are affixed; whereby moving said adjacent first and second shaft section ends toward each other will cause the end of said second shaft section to slidably engage said axial bore within said guide section of said coupling portion to operatively connect said first and second shaft sections in a drive assembly.

4,545,472

CLUTCH RELEASE BEARING

André Caray, Valence, France, assignor to Valeo, Paris, France

Filed Jul. 20, 1983, Ser. No. 515,490
Claims priority, application France, Jul. 20, 1982, 82 12629
Int. Cl.⁴ F16D *23/12*
U.S. Cl. 192—98 **15 Claims**



1. A clutch released bearing which comprises a drive member which is adapted to operate a clutch release device in a clutch, an operating member which is adapted to be operated by a control member, wherein said drive member and said operating member are coupled together in the axial direction but free to rotate relative to one another, a radial arm on said operating member, a transverse shoulder on said radial arm, a pad on said radial arm which is adapted to constitute an axial support for said control member, a peg adapted to couple said pad to said arm in the axial direction, a plate, a tangential flange on said plate which is adapted to constitute a radial support for said control member, a transverse flange on said plate which is perpendicular to said tangential flange and which is disposed between and adapted to be clamped between said pad and said transverse shoulder on said arm, and a hole in said tangential flange which is adapted to permit said peg to pass through it.

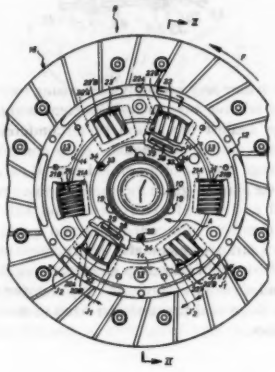
4,545,473

TORSION DAMPING DEVICE FOR AN AUTOMOTIVE CLUTCH PLATE ASSEMBLY WITH TWO FRICTION WASHERS, ONE OF WHICH IS FREELY SLIDABLY MOUNTED

Jacques Alas, Enghien-les-Bains, France, assignor to Valeo, Paris, France

Filed Feb. 16, 1982, Ser. No. 349,267
Claims priority, application France, Feb. 25, 1981, 81 03720
Int. Cl.⁴ F16D *3/14*
U.S. Cl. 192—106.2 **22 Claims**

1. A torsion-damping device, for an automotive clutch plate assembly, comprising at least two coaxial parts mounted to rotate relative to one another within predetermined limits of angular movement, elastic means operatively interposed circumferentially between said rotary parts, and friction means comprising at least two friction washers being interposed axially between said rotary parts, said elastic means comprising a first spring stage of at least one relatively low stiffness spring operative during small relative angular displacements between said rotary parts, said elastic means comprising a second spring stage of at least one relatively high stiffness, chordally oriented spring operative during larger relative angular displacements between said rotary parts, said second stage spring in the rest position of said torsion damping device being located partly, without circumferential play, in a housing formed in a first of the rotary parts and partly, with circumferential play J1 for one direction of rotation of said assembly and circumferential play J2 for the opposite direction, in another housing formed in the second of said rotary parts, friction torque caused by one of said friction washers being a multiple greater than 1 of the friction torque caused by the rest of said friction means of said torsion damping device operating at the same time, at least one lug associated with said one friction washer, at least one face of said one friction washer contacting a first of said two rotary parts, said one friction washer being freely slidably mounted about the axis of the torsion-damping device and the position of said one friction washer in the rest position of said torsion



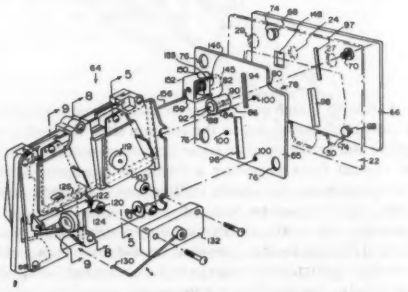
damping device being independent of the action of said springs of said elastic means, and said lug being disposed between said one friction washer and the second of said rotary parts, said lug being integral with a selected one of said one friction washer and said second rotary parts, said lug having a chordal length L1 and being received in a passage in the other of said friction washer and said second rotary part, said passages having a chordal length L2, the angles subtended by the chordal play J1, J2 and by the chordal lengths L1, L2 being such that the subtended angle corresponding to $[(J1+J2)-(L2-L1)]$ is between a value greater than 0° and no greater than 5°.

4,545,474

MOUNTING MEANS AND METHOD OF AFFIXING A DROP COIN MECHANISM

James R. Ridgley, and Bruce L. Reeder, both of Frederick, Md., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 7, 1983, Ser. No. 501,931
Int. Cl.⁴ G07F *1/04*
U.S. Cl. 194—1 E **6 Claims**



1. A method of affixing a drop coin mechanism to a panel of a coin-operated machine, the drop coin mechanism including a

mounting plate through which are provided a coin insertion slot and a coin return slot, the method comprising the steps:

(a) providing an outer plate having at least one boss projecting from one face thereof, and first threaded means spaced from said boss, the boss defining a lip spaced from said one face, at least part of said lip being directed generally toward said first threaded means, the outer plate having slots for registry with the slots of the mounting plate,

(b) providing on said mounting plate a first edge adapted to be received under said lip, and a second edge adapted to lie adjacent said first threaded means,

(c) providing the panel with removed portions for registry with the slots, said at least one boss and said threaded means,

(d) in any order:

(1) placing the outer plate against one face of the panel with said at least one boss projecting across the panel,

(2) placing the mounting plate against the other face of the panel with said first edge received under said lip and said second edge lying adjacent said first threaded means,

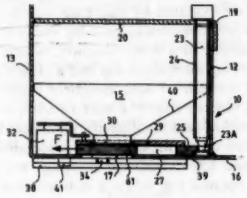
(e) engaging a second threaded means with said first threaded means to bring a portion of said second threaded means into bearing engagement with said second edge of the mounting plate.

4,545,475

SECURE COIN COLLECTION DEVICE FOR PRE-PAYMENT MACHINE

Maurice Fillod, Besancon, and Jean-Francois Larriere, Genuille, both of France, assignors to Flonic S.A., Montrouge, France

Continuation-in-part of Ser. No. 271,332, Jun. 8, 1981, abandoned. This application Nov. 22, 1983, Ser. No. 554,429
Claims priority, application France, Jun. 11, 1980, 80 12934
Int. Cl.[4] G07F *9/06*
U.S. Cl. 194—1 B **20 Claims**



1. In a pre-payment machine of the type having a single housing and including therewithin means for evaluating coins and means for distributing objects or access authorization for obtaining services;

an improved strong-box for the temporary storage of coins collected by the machine prior to their transfer into a collection device which is removably connectable to the machine, the strong-box comprising:

a receptacle for said coins formed by at least part of the housing and having a collection aperture provided therein communicating with the coin receptacle;

a removable lid disposed within the housing and normally covering the coin receptacle;

a movable seal normally covering the collection aperture, the seal being movable from a position covering the collection aperture to a position uncovering the collection aperture;

locking means associated with the movable seal, the locking means normally securing the seal in a position covering the collection aperture, the locking means being responsive to at least the engagement of the collection device directly to the housing and adjacent to the seal to release the seal and allow movement of the seal from the position covering the collection aperture to the position uncovering the collection aperture; and

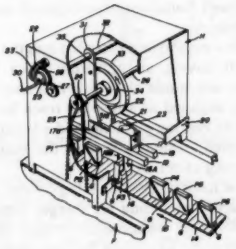
means for securing the lid to the coin receptacle, the lid securing means being disposed substantially within the coin receptacle and normally engaging the seal when the seal is in the position covering the collection aperture, the lid securing means being responsive to the movement of the seal from the position covering the collection aperture to the position uncovering the collection aperture to release the lid and allow its removal.

4,545,476

APPARATUS FOR ROTATING A MOVING PACKAGE HAVING SPACED GENERALLY PARALLEL OPPOSITE SIDES

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 19, 1983, Ser. No. 543,244
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—399 **2 Claims**



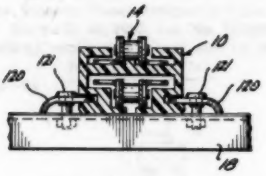
1. Apparatus for rotating one of a series of packages having spaced generally parallel opposite sides while being supported by and moved continuously on a moving conveyor along a predetermined path, said apparatus comprising slidably mounted support means having a driving pin and being disposed above said conveyor and movable in generally parallel synchronous relation therewith, a pivotally mounted driving arm having a slot for receiving said driving pin to impart movement to said support means via a lost motion connection, a rotator element mounted on and movable with said support means and having a generally U-shaped package enveloping means comprising a pair of spaced apart prongs which are in fixed positions relative to each other at such a distance as to allow clearance of the packages therebetween by straddling without gripping said one package, and pneumatically actuated rotatable driving means mounted on and movable with said support means and operable independently of the movement or position of said support means for imparting rotary movement to said rotator element, whereby upstream movement of said support means, of said rotator element, and of said driving means may be effected so as to cause said rotator element to straddle and bypass a preseleted one or more of said packages and to straddle said one package to be rotated and then to move downstream in synchronism therewith while rotating the said one package, the direction of rotation of said rotatable driving means being reversed for each successive rotating operation.

4,545,477

CHAIN CONVEYOR

Creighton J. Besch, Seattle, Wash., assignor to Conveyor Sales & Mfg. Co., Bellevue, Wash.

Filed Jun. 23, 1983, Ser. No. 506,980
The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.
Int. Cl.[4] B65G 15/60
U.S. Cl. 198—841 8 Claims



1. In a chain conveyor for loaded cartons and the like, wherein an endless conveyor chain has central roller-like bearing elements and laterally projecting wing-like bearing elements and is guided in a circuitous path including a return stretch immediately underlying a load-bearing stretch,

the improvement comprising a multisection chain support and guide track, individual sections of which are adapted to be mounted in alignment on transverse members of a conveyor support framework spaced apart longitudinally of the conveyor run,

said track sections comprising extruded lengths of synthetic material, each having an upwardly open longitudinal chain support and guide slot with a central bottom rib adapted to be engaged as a bearing track by the central chain roller-like bearing elements and adjoined by lateral side slots adapted to slidably receive the associated chain wing-like bearing elements,

said track section having opposite side portions which comprise downwardly extending leg flanges which continue the length of the track section and terminate at their lower edges in transversely extending footing flanges with bottom faces lying substantially in a common plane, and with a longitudinally extending gap formed between said footing flanges, ;p1 said track section having a downwardly open slot formed between said leg flanges with laterally extending slots in the opposite sides thereof for receiving the wing-like bearing elements of the chain return stretch accommodated in said downwardly open slot.

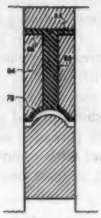
4,545,478

HARD CONTACT LENS SUCTION CUPS AND METHOD FOR THEIR PRODUCTION

Fred Waldman, 8929 E. Jewel Cir., Denver, Colo. 80231

Continuation-in-part of Ser. No. 396,233, Jul. 8, 1982, abandoned. This application Feb. 29, 1984, Ser. No. 584,558
Int. Cl.[4] B65D 85/00
U.S. Cl. 206—5.1 4 Claims

1. In a device for holding a hard contact lens in a soaking solution, said device comprising a stem terminating in a concave suction cup which being free of any air channel or vent, said cup terminating at a rim portion which comprises a substantially horizontal ledge, said ledge including a thickness which being at least as wide as the thickness of the wall of said cup, wherein the thickness of said ledge reinforcing said rim



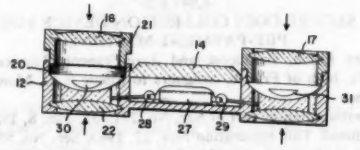
portion serves to prevent the solution from leaking into said cup.

4,545,479

CONTACT LENS CARRYING CASE WITH MAGNIFYING AID APPARATUS

Alberto A. Figari, 99 Foxhedge Rd., Saddle River, N.J. 07458

Filed Aug. 13, 1984, Ser. No. 640,258
Int. Cl.[4] A45C 11/04, 15/06; B65D 25/54; G02B 7/00
U.S. Cl. 206—5.1 10 Claims



1. A contact lens carrying case for accommodating contact lenses, said carrying case adapted to enable a user to view said lenses when accommodated by said case, comprising:

a right and a left cylindrical housing member coupled together by means of a center section, which each of said members having an opened top and a closed bottom, with said closed bottom of said members each containing a magnifying lens to enable a user to view a contact lens emplaced within said associated cylindrical member,

a right and a left cover member each associated with one of said right and left cylindrical housings and adapeted to cover said opened top when a contact lens is emplaced within said housing with each of said cover members having a magnifying lens for viewing said contact lens, whereby said magnifying lens of said closed bottom and said magnifying lens of said cover member enable a user to view said contact lens when emplaced in said housing from either the top or bottom and to further use said cover member lens and said closed bottom lens to obtain increased magnification when viewing said contact lens.

4,545,480

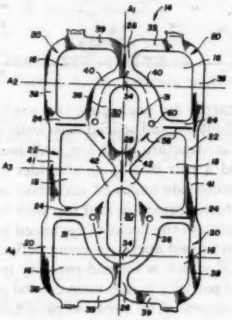
BOTTLE MULTI-PACKAGE AND MULTI-PACKAGING DEVICE

Mindaugas J. Klygis, Barrington, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 17, 1983, Ser. No. 542,879
Int. Cl.[4] B65D 71/00, 75/00
U.S. Cl. 206—151 11 Claims

1. A package making device for unitizing a plurality of containers, the device formed from a resilient, elastic and deformable sheet of plastic material, said device comprising two rows and three ranks of integrally connected narrow bands creating reconfigurable container receiving and gripping apertures, a longitudinal axis intersecting the transverse dimension of the device and situtating the rows on opposing sides

thereof, each rank including a rank axis perpendicularly disposed to the longitudinal axis and intersecting the outer band segment of each aperture at points generally midway between the longitudinal extremities of said outer band segments, the outer band segments of each aperture are substantially straight, the longitudinally adjacent aperture creating bands being interconnected by longitudinal webs located primarily at the juncture of the longitudinal adjacent straight segments, said longitudinal webs being located solely on the outboard side of a center line extending through rows of apertures, the major portion of the area of the apertures of the ranks at each longitudinal extremity of the device being disposed longitudinally outwardly of the respective rank axis, a pair of finger gripping



members, extending from both sides of the rank axis of the longitudinal innermost ranks, the gripping members including a pair of legs interconnected by a bight region, the legs of the gripping members integral with the inner band regions of said inner most rank of apertures, the bight region of each finger gripping member being generally on the rank axis of the longitudinal outermost ranks wherein two independent finger gripping loops are created along the longitudinal axis of the package with the outer margin of the members having a configuration complimentary to the inner band regions of the outermost ranks so they may lay flat in the plane of the device prior to application and extend upwardly from the plane subsequent to the application.

4,545,481

STENCILLING DEVICE

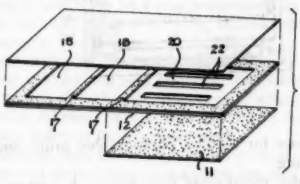
Dwight Smith, Harbor City, Calif., assignor to Marvin Elkins, San Diego, Calif., a part interest

Continuation-in-part of Ser. No. 486,325, Apr. 19, 1983, Pat. No. 4,476,976. This application Sep. 14, 1984, Ser. No. 650,867

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.[4] **B65D** *25/08*; **B32B** *29/00*

U.S. Cl. 206—219 **5 Claims**



1. A compartmented pouch for use in placing a fluid onto the surface of an object comprising:

at least two sealed compartments formed in said pouch,

separator means other than a breakaway sealing partition for forming a sealing separator between said compartments,

a first one of said compartments having a surface thereof stencilled to form at least one opening,

removable means placed on the stencilling surface, and

a fluid placed in a second one of said compartments wherein when said separator means is mechanically actuated to remove the sealing separation, the fluid in the second one of said compartments is caused to enter said first one of said compartments, whereby with the removable means removed from the stencilled surface and the stencilled surface placed against the surface of the object to receive the fluid the fluid passes through the opening in the stencilled surface onto the surface of the object.

4,545,482

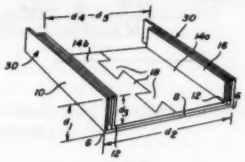
U-SHAPED SUPPORT PAD FOR APPLIANCES AND THE LIKE

Donald F. Novatny, Marion, Ohio, assignor to Boise Cascade Corporation, Boise, Id.

Filed Apr. 10, 1984, Ser. No. 598,738

Int. Cl.[4] **B65D** *85/00*

U.S. Cl. 206—320 **7 Claims**



1. A U-shaped support pad for appliances, furniture and the like, comprising

(a) a rectangular horizontal bottom blank (**2**) having two pairs of parallel opposed edges, respectively, said blank containing a first pair of fold lines (**6**) parallel with and adjacent one pair of said opposed edges, respectively, thereby to define a first center panel (**8**) and a pair of first side wall panels (**10**);

(b) a rectangular horizontal top blank (**4**) having two pairs of parallel opposed edges, respectively, said top blank corresponding generally with and being arranged parallel with and above said bottom blank, said top blank containing a second pair of fold lines (**12**) parallel with said first fold lines and adjacent the corresponding edges of said top blank, respectively, thereby to define a second center (**14**) panel and a pair of second side wall panels (**16**) corresponding with said first side wall panels;

(c) first means connecting together said first and second side wall panels, respectively, thereby to define a pair of side wall assemblies (**30**);

(d) said second center panel containing means defining an intermediate line of severence (S) in spaced relation between and parallel with said second fold lines, said second center panel being separated along said line of severance into two severed panel portions (**14***a*, **14***b*), said side wall assemblies (**30**) being pivoted upwardly about said first fold lines to vertical positions relative to said center panels, thereby to cause the spacing distance between said second fold lines to be less than that between said first fold lines, and the adjacent edges of said severed portions to overlap; and

(e) second means (**18**, **20**) connecting together the adjacent edges of said severed portions to maintain said side wall assemblies in their vertical positions, thereby to cause said support pad to have a U-shaped configuration.

4,545,483

CASING FOR A MAGNETIC TAPE CASSETTE

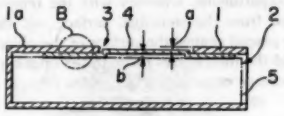
Haruo Shiba, and Shigetomo Takeda, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,418

Claims priority, application Japan, Apr. 30, 1982, 57-63625[U]

Int. Cl.[4] B65D *85/67, 27/04*

U.S. Cl. 206—387 10 Claims



1. A casing for a magnetic tape cassette made of a plastic material having a transparent window on at least one surface of the casing body characterized in that said transparent window is formed by laminating a bonding layer, to be bonded to said casing body, of a plastic sheet made of the same material as said casing body and a reinforcing layer of a plastic sheet made of the different material from said bonding layer.

4,545,484

FILING CASE

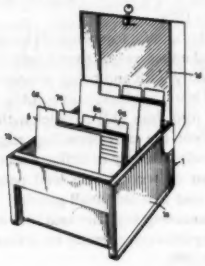
Benedikt Rohner, Zürich, Switzerland, assignor to Biella-Neher AG., Biel, Switzerland

Filed Jun. 12, 1984, Ser. No. 619,910

Claims priority, application Switzerland, Jun. 13, 1983, 3246/83

Int. Cl.[4] B65D *85/57*; B42F *17/12, 7/12*

U.S. Cl. 206—425 2 Claims



1. A filing case, particularly for diskettes, of the type having a bottom including a plurality of slots therein, two sidewalls, and a number of dividers disposed spaced one behind the other, said dividers including projecting labelling tabs and portions insertable in said slots and, together with portions of said bottom and said sidewalls, bounding a plurality of filing compartments, said dividers each having two mutually resilient legs constituting said portions insertable in said slots, those of said slots associated with said legs of a single one of said dividers being situated in a straight line, wherein said dividers are identical and asymmetrical in shape, disposed in even numbers, and narrower than the distance between said two sidewalls by substantially the width of one of said labelling tabs.

4,545,485

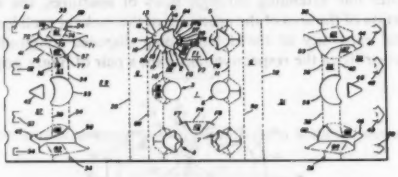
BOTTLE CARRIER CHIME ENGAGING FLAP STRUCTURE

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 1, 1984, Ser. No. 636,580

Int. Cl.[4] B65D *71/00*

U.S. Cl. 206—434 5 Claims



1. An article carrier for packaging two rows of bottles and comprising top, bottom, and spaced side walls interconnected to form a tubular structure, said top wall including a main central panel and a pair of sloping shoulder panels foldably adjoined to opposite side edges of said main central panel, a plurality of apertures formed in said top wall for respectively receiving therethrough the necks of packaged bottles, an edge portion of certain of said apertures being defined by two web structures each of which is formed partially in said adjacent sloping panel and partially in said main central panel, said web structures being separated by a transverse slit in said adjacent sloping panel and a pair of abutment tabs defining the remaining edge portion of the apertures with which said web structures are associated, said abutment tabs being separated from each other by a transverse slit one end of which coincides with the intersection of angularly related upper edges of said abutment tabs which edges define a V-shaped notch and said abutment tabs being foldably joined to said main central panel along individual fold lines which are disposed in substantially normal relation to each other and at approximately 45° to the longitudinal axis of said main central panel thereby to engage the associated bottle neck to tend to hold the associated bottle in normal relation to said main central panel and to prevent substantial movement of the heel of the associated bottle outwardly or inwardly of the open ended carrier.

4,545,486

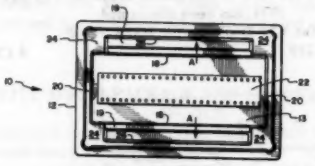
CONTAINER AND STORAGE SYSTEM FOR PHOTOGRAPHIC PRINTS AND NEGATIVES

Steve Bostic, 9830 Huntcliff Trace, Atlanta, Ga. 30338

Filed Apr. 5, 1984, Ser. No. 597,166

Int. Cl.[4] B65D *85/62, 85/48, 1/36*

U.S. Cl. 206—455 32 Claims



1. A container for holding photographic prints and negatives, comprising:

a substantially rectangular base having a contour which defines an interior area having transverse walls, longitudinal walls and a floor, said floor having at least one raised strip extending upwardly from the floor;

a first area for storing photographic negatives within the

interior area, said first area being defined by the floor and said raised strips which extend upwardly from the floor;

a second area for storing photographic prints within the interior area, said second area extending into the interior area to the top edge of said raised strips and being defined by said transverse and longitudinal walls such that photographic prints are capable of resting between said walls upon said raised strips, said first area being distinct from said second area, said first and second areas being disposed within said interior area such that the first area subtends the second area thereby the interior area is a capable of simultaneously receiving for storage both photographic negatives and photographic prints; and

a removable lid for securely covering the interior area of said base.

4,545,487

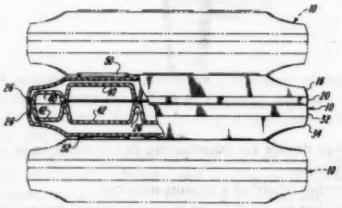
FOOD SERVING TRAY

Edward Asmus, Ft. Collins, Colo., assignor to Anchor Hocking Corporation, Del.

Continuation of Ser. No. 205,721, Nov. 10, 1980, abandoned. This application Oct. 16, 1984, Ser. No. 661,491

Int. Cl.⁴ B65D *21/02;* **A45C** *11/20;* **A47G** *19/02, 23/06*

U.S. Cl. 206—508 **6 Claims**



1. A food serving tray having a cover portion and a complementary container portion, said cover portion including a hood element shaped to define a generally planar upper surface peripherally bounded by a downwardly extending marginal skirt, and further including means defining a shallow arcuate depression extending between said marginal skirt portions of said marginal periphery and configured for continuous contact between a pair of oppositely disposed marginal skirt portions with a like pair of skirt portions on a tray stacked thereabove to stably support a plurality of said trays in stacked array;

a lid element having an upwardly projecting marginal skirt bonded to said downwardly extending marginal skirt;

said container portion including a support element having a downwardly depending marginal skirt; and

a base element having an upwardly projecting marginal skirt bonded to said downwardly depending marginal skirt on said support portion and defining a shallow arcuate depression extending between said marginal skirt portions of said base and further configured for continuous contact by said pair of oppositely disposed marginal skirt portions with a like pair of oppositely disposed marginal skirt portions of said hood on a tray positioned therebeneath;

means for indexing said cover to lie in interengaging relationship atop said container;

said cover including a distributed plurality of upwardly disposed cavities and said container including a distributed plurality of wells individual ones of which mate with respective different ones of said cavities to define corresponding different food compartments;

a receptacle system extending upwardly from said hood element and shaped to receive a container, said receptacle system being disposed in a central region of said upper surface within said shallow depression and projecting above the outer side margins of said upper surface;

and a matchingly disposed foot system extending downwardly from said base and engageable within the receptacle system in a like tray in stacked array, said foot system projecting downwardly no further than the level of the side margins of the under surface of said base, whereby the side margins of said upper surface and said under surface engage while said receptacle system indexes with said foot system and precludes lateral and rotational displacement of stacked trays with respect to each other in the stack.

4,545,488

DEVICE MONITORING THE QUALITY OF CIGARETTES IN A PACKAGING MACHINE

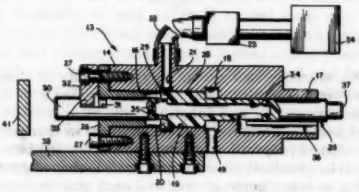
Enzo Seragnoli, and Antonio Gamberini, both of Bologna, Italy, assignors to G. D. Societa per Azioni, Bologna, Italy

Filed Apr. 15, 1983, Ser. No. 485,167

Claims priority, application Italy, May 13, 1982, 3421 A/82

Int. Cl.⁴ B07C *5/34;* **A24C** *5/32*

U.S. Cl. 209—535 **9 Claims**



1. A device for monitoring the quality of cigarettes in an input hopper comprising:

a housing;

a compressed air supply communicating with said housing;

a shaft moveable axially in said housing for detecting a defective cigarette by pressure thereon;

an ejector nozzle formed in said housing trained on cigarettes in said hopper for ejecting defective cigarettes; and

a valving body formed on said shaft for directly connecting said compressed air supply to said ejector nozzle.

4,545,489

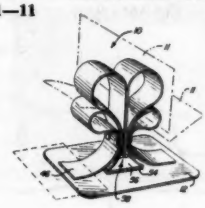
STORAGE RACK

Stephen R. Welch, 1227 S. Wilke Rd., Arlington Hts., Ill. 60005

Filed Apr. 15, 1983, Ser. No. 485,407

Int. Cl.⁴ A47F *7/00*

U.S. Cl. 211—11 **10 Claims**



1. A storage rack comprising:

a plurality of resilient strips each returned against itself in a contact area to define an expanded loop with a closed end at the contact area;

means for securing the closed ends of said strips to one another so that each loop has facial engagement over a substantial area with at least one adjacent loop, each of the strips being secured to other strips only at the closed loop end; and

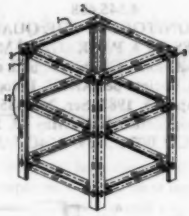
means for supporting the strips at said closed ends, whereby objects can be inserted and firmly, frictionally retained between the facially engaged portions of adjacent loops.

4,545,490

SAFETY STEEL ANGLE ASSEMBLY RACK

Yu-Sheng Hsiao, 11th Fl., No. 78, Chang Chun Rd., and Huey-Der Cheng, No. 328, Ho Ping West Rd., Sec. 3, both of Taipei, Taiwan

Filed Jun. 6, 1983, Ser. No. 501,157
Int. Cl.⁴ A47B *47/00*
U.S. Cl. 211—191 **6 Claims**



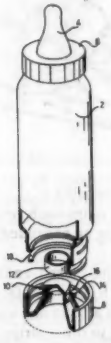
1. An assembly rack comprising a plurality of steel angles used as vertical supports and horizontal joining rods interconnected transversely and longitudinally by a plurality of L-shaped joint members and bolts, each of the steel angles having two L-shaped perpendicular sides, each side being bent inward along its longitudinal plane to form small L-shaped guide edges defining an inner guide groove and each side having at least one row of spaced holes arranged longitudinally along the surface thereof, each of said joint members having an L-shaped surface and two interconnected sidewalls hanging down from the longer outer edge of the L-shaped top surface, each sidewall having a guide opening extending from the top surface to the lower edge of the sidewall which divides the sidewall into inner and outer parts, and a screw hole in each of the inner and outer parts of the sidewall.

4,545,491

FEEDING BOTTLE HAVING AN AIR INTAKE VALVE

Hans F. Bisgaard, Hasselager, and Jörgen D. Jensen, Ny Solbjerg, both of Denmark, assignors to Jens C. Jensen, Ribe, Denmark

PCT No. PCT/DK82/00095, § 371 Date May 19, 1983, § 102(e) Date May 19, 1983, PCT Pub. No. WO83/01381, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 20, 1982, Ser. No. 503,150
Claims priority, application Denmark, Oct. 21, 1981, 4642/81
Int. Cl.⁴ A61J *9/04*
U.S. Cl. 215—11 D **5 Claims**



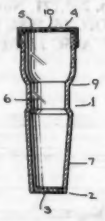
1. A feeding bottle having a suction outlet and an air intake valve spaced from the suction outlet, said air intake valve including an interior resilient valve sheet member cooperating with an apertured rigid wall portion of the bottle so as to constitute a check valve operable to open for admission of air into the bottle in response to a predetermined vacuum occurring therein, characterized in that the resilient valve sheet member is mountable so as to be generally stretched over a convex surface of said rigid wall portion, an air inlet hole is provided in a sub area of said rigid wall portion, a surface of the sub area of the rigid wall portion is engaged by the sheet member and is of a smaller convexity than adjacent or surrounding surface portions of the rigid wall portion.

4,545,492

DEVICE FOR MAINTAINING DRY CONDITIONS IN VESSELS

Raymond A. Firestone, 60 Hunter Ave., Fanwood, N.J. 07023

Continuation-in-part of Ser. No. 430,801, Sep. 30, 1982, abandoned. This application Apr. 27, 1984, Ser. No. 604,812
Int. Cl.⁴ B65D *81/24*
U.S. Cl. 215—227 **8 Claims**



1. A cover device for maintaining dry conditions in vessels which comprises:

(a) a member made of a porous material;

(b) a member made of a non-porous material having at least one pinhole therein wherein the pinhole has an equivalent area as if it had a diameter of from 0.01 to 0.2 mm.;

(c) a hollow portion between the members (a) and (b); and

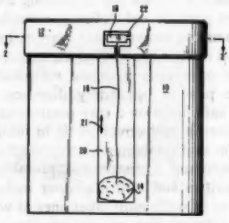
(d) means on the cover device for attaching said cover device to a vessel such that the member (a) communicates with the interior of the vessel.

4,545,493

CONTAINER AND CLOSURE WITH TAMPER INDICATING MEANS

Horace L. Shivers, 21 Filmore St., Trenton, N.J. 08638

Filed Apr. 23, 1984, Ser. No. 602,717
Int. Cl.⁴ B65D *55/02*
U.S. Cl. 215—230 **10 Claims**



1. In combination with a closed bottle and means for opening said bottle, the improvement comprising:

an elongated member having a first end and a second end, said first end being attached to said means for opening said bottle;

a transparent enclosure having an interior wall, said enclosure being in contact with said bottle; and,

means for visibly marking said enclosure located inside said enclosure and attached to said second end of said member, said means for visibly marking said enclosure being disposed inside said enclosure whereby removal of said means for opening said bottle visibly marks at least a part of the interior wall of said enclosure.

4,545,494

TAMPER INDICATING COVER

Nina P. Sawicki, 8347 Ranchito Ave., Panorama City, Calif. 91402

Division of Ser. No. 467,103, Feb. 16, 1983,. This application Mar. 6, 1984, Ser. No. 591,223

Int. Cl.⁴ B65D *41/54*

U.S. Cl. 215—232 **5 Claims**

1. A tamper-indicating cover for a container closed by a cap and having an annular indent at a spaced distance below the cap, the container further having a selected relief design thereon, the cover comprising:

a shroud portion positioned over the cap in access-preventing relationship thereto and having an annular junction region, the shroud portion being of a heat shrink composition which is shrunk wrapped to the container whereby the shroud conforms to the relief design of the container;

an annular safety band integral with the shroud portion and extending from the annular junction region of the shroud; and

a thread extending from the safety band, in a helical orientation around the container toward the cap, underneath the shroud portion, and in noncoincidence with the relief design on the container the end of the thread protruding for being pulled to tear the shroud and enable removal of the shroud.

4,545,495

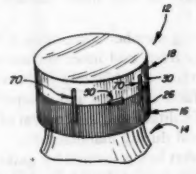
SNAP ACTION HINGE WITH CLOSED POSITION STRAIGHT STRAPS

John P. Kinsley, Crystal Lake, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Filed Nov. 2, 1984, Ser. No. 667,744

Int. Cl.⁴ B65D *43/14*

U.S. Cl. 215—235 **21 Claims**



1. A resilient snap-action closure for a container, said closure comprising:

a body for being joined to said container and defining an opening for dispensing the contents of said container, said body including at least a first convexly curved exterior portion;

a cover movable between a closed position on said container for engaging said body to close off said body opening and an open position spaced from said body opening, said cover including at least a second convexly curved exterior portion adapted to lie adjacent and in registry with said first convexly curved exterior portion when said cover is in said closed position;

a main hinge means for hingedly connecting said convexly curved exterior portions of said body and cover along a main hinge axis; and

two spaced-apart connecting elements, each said connecting element being joined to said body first curved exterior portion with a first hinge and being joined to said cover second curved exterior portion with a second hinge so as to locate said connecting elements offset on one side of said main hinge axis when said cover is in said open position whereby said cover is held open, the closure deforming elastically as said cover is moved from said open position to said closed position about said main hinge axis until said closure snaps through a dead center position at which said closure is maximally deformed and beyond which both of said connecting elements are located on the other side of said main hinge axis where the deformation is at least partly reduced so that said cover is urged to said closed position, said connecting elements lying on opposite ends of said main hinge means, each said connecting element having a generally linear configuration adjacent said first and second curved exterior portions when said cover is in said closed position and having a non-linear configuration lying generally in a plane parallel to said main hinge axis when said cover is in said open position.

4,545,496

PLASTIC CLOSURE WITH MECHANICAL PILFER BAND

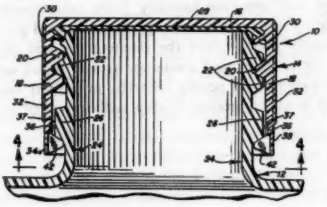
Sheldon L. Wilde, and Thomas J. McCandless, both of Crawfordsville, Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

Continuation of Ser. No. 286,375, Jul. 26, 1981, Pat. No. 4,418,828. This application Dec. 1, 1983, Ser. No. 608,318

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.⁴ B65D *41/34*

U.S. Cl. 215—252 **12 Claims**



1. A plastic closure comprising:

a closure cap including a top wall portion and a depending annular skirt portion; and

pilfer band means depending from and at least partially detachably connected to said skirt portion of said cap by fracturable means, said skirt portion and said pilfer band means being at least partially severed from each other by score line means extending circumferentially about at least a portion of said closure,

said fracturable means comprising a plurality of circumferentially spaced bridges disposed on and extending between inwardly facing surfaces of said skirt portion and said pilfer band means in the region of said score line means, said score

line means extending into at least some of said bridges whereby said ones of said bridges are partially severed and frangible so that said frangible bridges at least partially detachably connect said pilfer band means to said skirt portion.

4,545,497

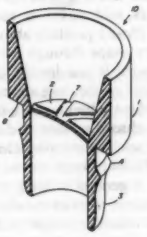
CONTAINER CAP WITH FRANGIBLE SEPTUM

Eugene F. Martha, Jr., North Attleboro, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Nov. 16, 1984, Ser. No. 672,309

Int. Cl.[4] B65D *39/04*

U.S. Cl. 215—253 **5 Claims**



1. A one-piece cap formed of a resilient material and adapted to be inserted into a container adapted to hold a liquid sample comprising:

an upper part and a lower part, said upper part remaining externally positioned from the interior of said container when said cap is inserted therein, said lower part adapted to be matingly and removably inserted into the interior of said container;

the lower surface of said upper part extending radially from said lower part to form a shoulder for sealingly contacting the rim of said container;

said upper part including means defining a septum suitable for piercing by a needle, said septum having areas of reduced thickness forming grooves therein such that said septum will separate laterally from said needle when pierced by said needle creating a space around said needle sufficiently greater than the diameter of said needle to allow air to enter said container as said liquid sample is withdrawn by said needle whereby no partial vacuum is formed in said container during withdrawal of said sample.

4,545,498

CONTAINER WITH LID FOR EFFERVESCENT PRODUCTS

Harry Schmid, Wil, Switzerland, assignor to Asepta AG Wil/SG, Wil, Switzerland

Filed Apr. 5, 1984, Ser. No. 597,057

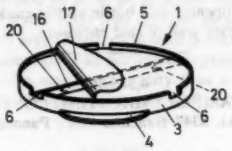
Claims priority, application Switzerland, Apr. 8, 1983, 1919/83

Int. Cl.[4] B65D *51/16*

U.S. Cl. 215—260 **7 Claims**

1. A container for effervescent products with a lid having at least one opening to permit escape of the gas, comprising:

a layer disposed on the lid and covering said opening, and a passage disposed between said layer and said lid, said passage leading to the exterior and being connected with the opening, and said passage comprising at least one



channel recessed in a surface of the lid, said at least one opening communicating with said channel.

4,545,499

CONTAINER CLOSURE

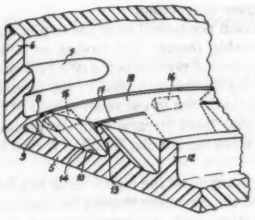
Julian Bennett, and Bernard Salsby, both of Colchester, England, assignors to National Plastics Limited, Colchester, England

Continuation of Ser. No. 461,263, Jan. 26, 1983, abandoned. This application Dec. 6, 1984, Ser. No. 678,387

Claims priority, application United Kingdom, May 20, 1982, 8214691

Int. Cl.[4] B65D *53/00*

U.S. Cl. 215—352 **13 Claims**



1. In a container closure comprising an injection moulded blank and an annular gasket of synthetic plastics material formed in situ in the blank, and including an end wall and a continuous side wall upstanding from said end wall and enclosing an inner surface of said end wall, said annular gasket being disposed on said end wall adjacent said side wall, the improvement comprising:

a plurality of spaced-apart retaining members upstanding from said inner surface of said end wall of said injection moulded blank, and

an annular region of said inner surface free of retaining members,

each said retaining member comprising a flap part upwardly inclined away from said inner surface and presenting to said inner surface an obliquely inclined substantially flat retaining surface, said flaps and obliquely inclined retaining surfaces facilitating axial removal of the closure blank from the mould during manufacture,

said annular gasket being formed by gasket material or precursor material in the liquid state introduced into the closure to flow at least partly around said retaining members and beneath said retaining surfaces, and into said annular region free of retaining members,

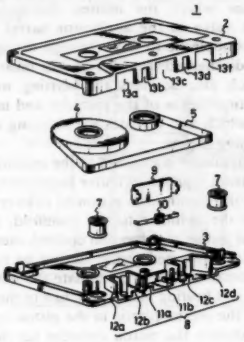
said material being thus retained in the blank upon solidification, by said retaining members and serving in said annular region, for sealing cooperation with a container rim.

4,545,500

MAGNETIC TAPE CASSETTE

Tokundo Yamaguchi, Tama; Masanori Kimizuka, Tokyo, and Isao Kawashima, Hatoyama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,388
Claims priority, application Japan, Dec. 29, 1982, 57-233190; Dec. 29, 1982, 57-233189; Dec. 29, 1982, 57-233188
Int. Cl.[4] G11B *23/02*
U.S. Cl. 220—4 B 4 Claims



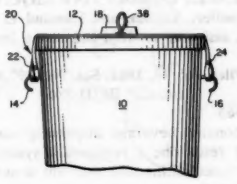
1. A tape cassette for holding a magnetic tape inside thereof comprising: a first member forming an upper half; a second member forming a lower half cooperating with said first member to define a case having an enclosed space for accommodating said magnetic tape; a plurality of openings formed in a front of wall portion of said case; and a third member that integrally includes a plurality of tape guide members for guiding said tape, arranged in said case and positioned near said openings, a fixed pin secured to one of said first or second members and interconnected to said third member, both side surfaces of said third member contacting respective concave surface portions formed on said first and second members whereby the position of said third member in vertical direction is restricted by the inside surfaces of said first and second members; said third member being formed of synthetic resin and ceramic power.

4,545,501

GARBAGE CAN LID RETAINER

Daniel DeFord, 13131 Brimhall Rd., Bakersfield, Calif. 93300

Filed Nov. 1, 1984, Ser. No. 667,427
Int. Cl.[4] B65D *45/00*
U.S. Cl. 220—318 3 Claims



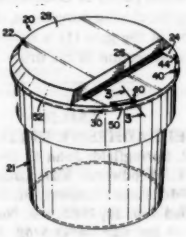
1. A garbage can lid retainer for retaining a cover on a garbage can where the garbage can is provided with a pair of handles, said lid retainer comprising a narrow strip of elastic fabric adapted to engage the top surface of the lid, narrow strips of non-elastic fabric secured to the opposite ends of said strip of elastic fabric, the width of the strips of said non-elastic fabric not greater than the width of said elastic fabric whereby the garbage can lid retainer can be compactly rolled-up for storage, means attached to said strips of non-elastic fabric for releaseable attachment to said handles on said garbage can and for varying the effective length of the garbage can lid retainer whereby the garbage lid retainer can be releaseably attached to said handles, the length of said flexible strip selected so when said strip of elastic fabric engages the top surface of said lid and the strips of non-elastic fabric are attached to the handles of the garbage can, the lid of the garbage can will be retained on the garbage can with sufficient force to hold the lid on the can against efforts of animals to dislodge the lid, and a handle formed from fabric, the width of said handle not greater than the width of said narrow strip of elastic fabric for compactness in storage when the garbage can lid retainer is rolled-up, said handle secured to the center part of said narrow strip of elastic fabric whereby the garbage can lid retainer can be pulled over the lid until it embraces the side of the garbage can in a convenient location when the lid of the garbage can is removed.

4,545,502

REFUSE CONTAINER HAVING AN UPPER ROLLED LIP PORTION AND COOPERATING COVER

Edward J. Reuter, Excelsior, Minn., assignor to Reuter, Inc., Hopkins, Minn.

Filed May 14, 1984, Ser. No. 609,731
Int. Cl.[4] B65D *43/14, 51/04*
U.S. Cl. 220—334 2 Claims



1. A refuse container assembly, comprising:

(a) container means open at the top thereof for receipt of refuse, the container means including a sidewall and a bottom wall, an upper edge portion about a top circumference of the container means extending outwardly away from the container means and downwardly, the upper edge portion having a downwardly opening channel about the exterior of the container means having a U-shaped cross section, the channel further having first and second spaced apart, downwardly extending sidewalls and a top wall interconnecting the first and second sidewall, the top wall of the U-shaped channel including a radiused portion proximate each end thereof interconnecting the first and second sidewalls, the first sidewall being formed by the sidewall of the container means, the second sidewall being spaced outwardly therefrom;

(b) container cover means for enclosing the container means, the container cover means including a first section secured to the U-shaped channel and a second section hingedly attached to the first section, the first and second sections including outer edges directed downwardly about the circumference of the container means, said outer edges extending parallel to and being in contact with the second sidewall of the U-shaped channel; and

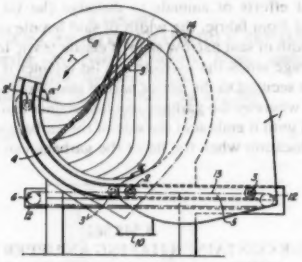
(c) fastener means for fastening the first section of the cover means to one of the top and second sidewalls of the U-shaped channel whereby the container cover means can be fastened to the outside of the container means.

4,545,503

GATE FOR BARKING DRUM AND METHOD OF CLOSING

Tapio Punakivi, Luvia, Finland, assignor to Rauma-Repola Oy, Pori, Finland

Filed Dec. 21, 1984, Ser. No. 685,150
Claims priority, application Finland, Dec. 22, 1983, 834755
Int. Cl.[4] B65D *43/20*
U.S. Cl. 220—345 **9 Claims**



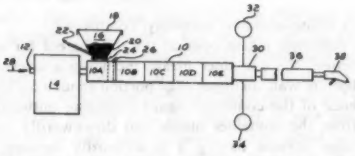
1. Method for closing the gate of a rotary barking drum intended for barking of wood, whereby the gate is rotated so that it is shifted so as to close the discharge opening at the end of the barking drum partly or completely, c h a r a c t e r i z e d in that, during the closing movement, the centre of the movement of rotation of the gate (1) is shifted and approaches the centre of the cross-section of the drum.

4,545,504

HOT MELT ADHESIVE DELIVERY SYSTEM

David A. Fabel, Springfield; John C. Hoagland, Longmeadow, and Chester L. Woodworth, East Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 31, 1983, Ser. No. 462,167
Int. Cl.[4] B67D *5/62, 5/08*
U.S. Cl. 222—55 **13 Claims**



1. A system for intermittent supply of a molten thermoplastic, which comprises:

(a) an extruder comprising a barrel having a single screw therein, said extruder equipped with means to rotate the screw and with means to start and stop the screw rotating means and having a first zone for receiving solid thermoplastic, a second zone for melting the thermoplastic and a third zone for metering the molten thermoplastic from the extruder, said third zone having a discharge end;

(b) a reservoir containing the thermoplastic in the form of solid granules, the reservoir being attached to the barrel of the extruder at the receiving zone and having a throat communicating with the extruder barrel through which the solid granules are fed to the extruder;

(c) cooling means at the receiving zone of the barrel of the extruder to allow the thermoplastic therein to remain in granular form until it is passed to the melting zone of the extruder;

(d) heating means in the barrel of the extruder to progressively heat and melt the thermoplastic in the melting zone and maintain it molten in the metering zone;

(e) a heated manifold to receive the molten thermoplastic from the discharge end of the extruder, to maintain it in the molten state and to distribute it to at least one heated hose; and

(f) an applicator attached to the delivery end of said at least one heated hose, said applicator comprising a housing, an applicator barrel to receive the molten thermoplastic from the heated hose, the applicator barrel terminating in a nozzle from which the molten thermoplastic is discharged, a valve in the applicator barrel to allow the molten thermoplastic to flow through the applicator barrel and be discharged from the nozzle, means to open the valve which also actuates the starting means for the screw-rotating means of the extruder and means to close the valve which also actuates the stopping means for the screw-rotating means;

wherein an accumulator is attached to the manifold, said accumulator comprising a piston cylinder to receive molten thermoplastic from the manifold, a piston to deliver molten thermoplastic from the cylinder to the manifold, a piston ram connected to the piston, a piston ram control, means to actuate the piston ram control, said piston having an exhaust stroke and an intake stroke means to de-actuate the extruder screw-rotating means, and heating means attached to the piston cylinder to maintain the thermoplastic in the piston cylinder in the molten state, wherein the piston cylinder (at the exit to the manifold and the piston are tapered to allow substantially complete elimination of the molten thermoplastic from the accumulator at completion of the exhaust stroke of the piston, wherein the piston is equipped with a flexible metallic compression seal which bears against the piston cylinder.. to wipe the wall of the piston cylinder clean of molten thermoplastic on the exhaust stroke of the piston, wherein during discharge of molten thermoplastic from the applicator the piston ram control is actuated to cause the piston to deliver molten thermoplastic from the piston cylinder into the manifold, wherein during the valve closed position of the applicator, the piston ram control and the screw-rotating means of the extruder are actuated to allow the extruder to deliver molten thermoplastic via the manifold to the piston cylinder, and wherein when the piston cylinder is full of molten thermoplastic during the valve closed position of the applicator, the extruder screw-rotating means is de-actuated; and wherein the manifold is equipped with a pressure overload sensing means which actuates a circuit breaking means and shuts off power to the system when the pressure of the molten thermoplastic reaches a set overload value.

4,545,505

ELECTRONIC CONTROL CIRCUITS FOR ELECTRICALLY CONDUCTIVE LIQUIDS/SOLIDS

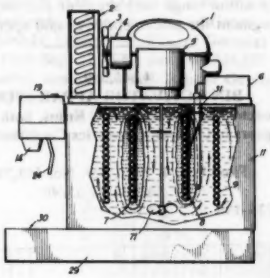
Richard J. Mueller, Atlanta, and Edmund E. Chow, Lilburn, both of Ga., assignors to Reed Industries, Inc., Stone Mountain, Ga.

Filed Jul. 14, 1982, Ser. No. 397,995
Int. Cl.[4] B67D *5/62*
U.S. Cl. 222—65 **14 Claims**

7. In a carbonated beverage dispensing machine having a cooling water reservoir; a refrigerant system including an evaporator disposed within said reservoir so as to cool a supply of coolant water therein, a condenser, and a compressor for circulating refrigerant through said evaporator and said condenser in a closed cycle so as to build up an ice mass around said evaporator; a carbonated water cooling coil disposed in said reservoir; a carbonated water reservoir connected to said carbonated water cooling coil; pump means for supplying water to said carbonated water reservoir; at least one dispensing nozzle connected to said carbonated water cooling coil; solenoid valve means for controlling the dispensing of a carbonated beverage from said nozzle; an improved ice sensing apparatus comprising in combination:

probe means for sensing the size of said ice mass, said probe means comprising an electrically conductive rod having a water impervious electrically insulated sheath surrounding said rod so that the tip thereof is exposed, said tip being disposed in said coolant water reservoir adjacent to said evaporator whereby said tip is alternately enclosed in said ice mass and exposed to said coolant water, as said ice mass grows and shrinks, respectively;

an electronic control means connected to said probe means comprising a source of balanced AC voltage connected to said probe means through a resistive network having an output point;



peak detecting means connected to said output point, said peak detecting means including a rectifier and a parallel resistance-capacitance circuit for providing a DC control signal whose magnitude is a function of the size of said ice mass as sensed by said probe means; and Schmitt trigger comparator means, connected to said parallel resistance capacitance circuit for providing a control output signal to said compressor in response to relative values of said DC control signal and a predetermined reference voltage, whereby operation of compressor, controls the size of said ice mass in response to conditions detected by said probe means.

4,545,506

GAS PRESSURE OPERATED DISPENSING CONTAINER

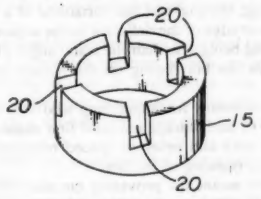
Motoaki Kadono, Fukui, Japan, assignor to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 20, 1984, Ser. No. 591,613

Claims priority, application Japan, Mar. 22, 1983, 58-41076[U]

Int. Cl.⁴ B65D *35/28*

U.S. Cl. 222—95 **4 Claims**



1. In a gas pressure operated dispensing container for discharging viscous liquids wherein a collapsible compartment containing the liquid to be dispensed is mounted inside a pressurized canister and has an end closure fitted with a dispensing valve having an elastomeric valve seal inside the compartment, the improvement which comprises:

a rigid reinforcing ring including a peripheral wall having a top portion, said top portion of wall engaging a shoulder of a cover plate installed in an open end of the collapsible compartment, and said rigid reinforcing ring having an air passage extending through the peripheral wall from said top portion to a location below where the shoulder of the cover plate contacts the peripheral wall.

4,545,507

METERING PUMP

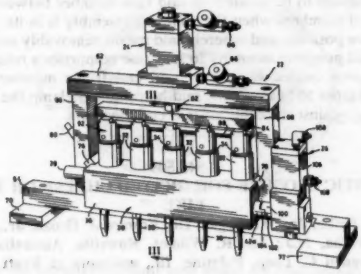
Heinz Barall, Don Mills, Canada, assignor to Hibar Systems Ltd., Thornhill, Canada

Filed Sep. 23, 1982, Ser. No. 422,413

Claims priority, application Canada, Jun. 4, 1982, 404504

Int. Cl.⁴ B67D *5/46*

U.S. Cl. 222—137 **11 Claims**



1. A metering pump comprising:

a unitary pumping assembly;

a base supporting said pumping assembly in an operative position;

means removably securing said pumping assembly to said base;

said pumping assembly comprising at least one pump cylinder having a plunger mounted to reciprocate therein along an axis, the plunger extending outwardly from one end of the cylinder and the cylinder having an opening at its opposite end through which liquid can be drawn into and dispensed from the cylinder upon reciprocation of said plunger; a housing disposed at said opposite end of the cylinder and having an internal valve chamber communicating with said cylinder opening; a rotary valve member mounted to turn in said chamber about a further axis between first and second positions; a dispensing nozzle associated with said cylinder and communicating with said valve chamber; and a liquid inlet communicating with said valve chamber; said rotary valve member being adapted to alternately allow communication between said cylinder and said liquid inlet and between said cylinder and said dispensing nozzle in moving between its first and second positions, so that liquid can alternately be drawn into the cylinder and dispensed through said nozzle by movement of said plunger;

a linear actuator permanently mounted on said base and having an output member which is linearly reciprocable generally parallel to said axis of reciprocation of the plunger when said pumping assembly is in said operative position;

means disengageably coupling said output member and said plunger, including respective male and female formations which are shaped to interfit with one another, said male formation being trapped between portions of said female formation in the direction of reciprocation of the coupling means when said actuator is in operation, whereby said actuator can drive the plunger in both directions of reciprocation;

a rotary actuator permanently mounted on said base and having an output member which is turnable about an axis

parallel to said axis of the rotary valve member when said pumping assembly is in said operative position; and,

means disengageably coupling said rotary actuator output member and said valve member, including two disengageable coupling formations, one of which is shaped to define a transverse slot, and the other of which is received in said slot so as to permit said output member to turn between its first and second positions;

whereby said pumping assembly can be removed as a unit from said base after releasing only said securing means;

wherein said base comprises a generally rectangular frame including a base member, an outer member generally parallel to said base member, and end members generally parallel to one another and normal to said base member and said outer member, and wherein said housing is adapted to be located on said base member between said end members when the pumping assembly is in its operative position, and wherein said means removably securing said pumping assembly to said base comprises a releasable clamp carried by one of said end frame members and adapted to bear against said housing and clamp the housing against the other of said end members.

4,545,508

PLASTIC CLOSURE FOR GRATED CHEESE OR THE LIKE

B. Jay Cribb, Jr., Waukegan, Ill.; Edward J. Drozd, Jr., Lake Hiawatha, N.J.; Ian R. Wilmot, Rowville, Australia, and Debradell C. Leap, Palatine, Ill., assignors to Kraft, Inc., Glenview, Ill.

Filed Jan. 10, 1983, Ser. No. 456,803
Int. Cl.[4] B65D *47/08*
U.S. Cl. 222—153 **6 Claims**

1. A rigid one piece multiaction organopolymeric closure for a container for particulate materials such as grated cheese or the like which may be readily opened and closed, which provides a substantially airtight seal, and which selectively permits bulk or broadcast removal of the particulate product from the container comprising,

a substantially planar two layer composite top panel and a substantially cylindrical skirt projecting from said top panel for engagement with the proximate rim of an associated cylindrical container, said two layer composite top panel comprising a circular base panel and an overlying lid panel integrally joined together at a portion of their respective circumferential edges by means of an assembly hinge element,

said base panel having a centrally located bulk access aperture for bulk removal of particulate material from said container, a plurality of assembly holes at the side of said base panel proximal to said assembly hinge element;

said base panel having a plurality of broadcast holes radially outside said aperature at the side of said base panel distally of said hinge elements for the broadcast of particulate material from said container;

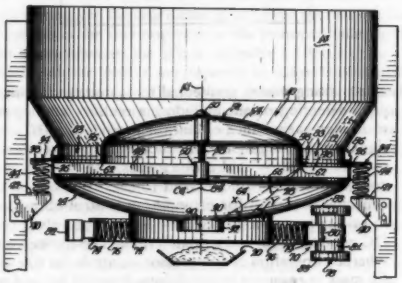
said overlying lid panel comprising a generally crescent-shaped fixed position annular hinge base segment, a generally crescent-shaped broadcast lid closure segment, and a bulk aperture closure segment joined to said fixed position hinge base segement by a bulk access hinge element, said overlying lid panel segment having a plurality of posts which project through said assembly holes of said base panel in interlocking engagement to maintain said annular hinge base segment in fixed position adjacent said base panel, said fixed position annular hinge base segment being integrally joined to said broadcast lid closure segment by two crescent hinge elements respectively joining their respective crescent ends, said broadcast lid closure segment having tongue-in-groove fitment with said plurality of broadcast holes in said base panel for placement over said holes, and bulk aperture closure segment having tongue-in-groove fitment with said bulk access aperture of said base radially inwardly of said annularly surrounding fixed position hinge base segment and broadcast lid closure segment for placement over said aperture.

4,545,509

BIN ACTIVATOR APPARATUS

Albert Musschoot, and Richard B. Kraus, both of Barrington, Ill., assignors to General Kinematics Corporation, Barrington, Ill.

Filed Feb. 4, 1983, Ser. No. 463,711
Int. Cl.[4] B65G *65/40*
U.S. Cl. 222—198 **10 Claims**



1. A bin activator apparatus for moving material from a storage bin having a discharge opening in the bottom thereof, said activator apparatus comprising

(a) means for receiving material from the discharge opening of the storage bin and discharging same at a uniform rate, said means having a bottom surface sloping generally downwardly and inwardly toward an outlet opening at the midportion thereof;

(b) a deflector carried by said means and being spaced above said means, said deflector having a lower edge spaced from the side wall of said means and having a center portion above the outlet opening, the angle to the horizontal of a line extending from the lower edge of the deflector to the adjacent edge of the outlet opening being less than the static angle of repose of the material from the bin resting on the bottom surface of said means;

(c) resilient means for supporting said first named means relative to said storage bin, said first named means overlapping with and being in spaced relationship with said discharge opening of the bin;

(d) vibrator means for providing circular orbital vibratory motion to said first named means and to said deflector for discharging a flow of material from said outlet opening; said vibrator means comprises:

(i) exciter means encircling said outlet opening and being resiliently connected to said material receiving means,

(ii) a vibration generator and a counterweight mounted diametrically opposite each other on said exciter means whereby the center of gravity of the activator apparatus falls on the vertical axis of said first named means between said first named means and the deflector means; and

(iii) said vibration generator and exciter means providing circular orbital vibratory motion in the plane of said outlet opening for moving material toward said outlet opening and providing a pitching vibratory motion about said center of gravity whereby the deflector means vibrates material in contact therewith radially outwardly and the concave surface of the first named means vibrates material in contact therewith inwardly toward said outlet opening.

4,545,510

DISPENSER FOR FLOWABLE SUBSTANCES

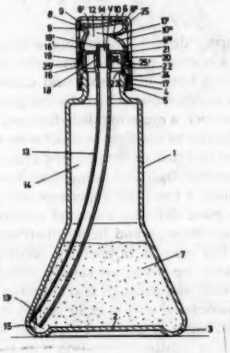
Herbert Mettenbrink, Lohne, Fed. Rep. of Germany, assignor to Bramlage GmbH, Lohne, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,655

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1981, 8138264[U]

Int. Cl.⁴ B65D *47/34*

U.S. Cl. 222—209 **21 Claims**



1. In a dispenser for flowable substances including, an elastically resilient squeeze head having a valve nozzle-opening and a bottom for said squeeze head, said bottom forming a part of a cup shaped dispenser housing cap arranged on a dispenser housing, and a suction tube extending from an opening in the squeeze-head bottom to a bottom portion of the dispenser housing connecting the bottom portion of the dispenser housing to the squeeze head via a non-return valve, the improvement wherein:

the dispenser housing cap has an offset step-shaped wall including an upper circumferential wall section of relatively smaller cross section which extends into the squeeze head;

the squeeze-head bottom opening is formed through a nipple having a projected portion which projects from the squeeze-head bottom in a direction into the dispenser housing, said nipple continuing above said squeeze head bottom on a squeeze-head side thereof to an end of said nipple;

said non-return valve comprises a flutter valve connected to said nipple;

an upper section of said upper circumferential wall section of said cap is formed with an external tooth profiling constituting means for form-interlocking overlapping engagement with an edge section of said squeeze head;

an upper, substantially cylindrical section of said dispenser housing continues into a neck portion thereof, the latter being formed with an outer thread engaging said cap, the latter constituting a screw cap;

said screw cap further defines an air equalization opening in a region of a step of said offset step-shaped wall of said cap; and

an upper cap is positionable over said screw cap, closing said air equalization opening from the outside.

4,545,511

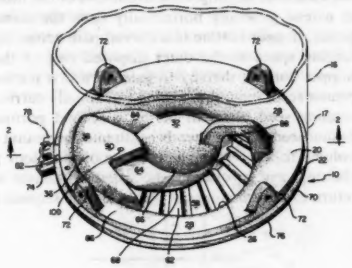
PEANUT SEED METER

Anthony Lastinger, Tifton, Ga., assignor to Kelley Manufacturing Company, Tifton, Ga.

Filed Oct. 26, 1982, Ser. No. 436,673

Int. Cl.⁴ A01C *7/00*

U.S. Cl. 222—367 **26 Claims**



1. An improved peanut seed meter for continuously removing at a selected rate for planting a selected quantity of seed peanuts from a bulk quantity thereof contained within a hopper, said seed meter comprising:

a peanut hopper bottom including means for attachment thereof to the bottom rim of the peanut hopper, said hopper bottom comprising

an outer disposed ring having an exterior diameter of a size for engaging the lower rim of the hopper and an inner diameter, the top surface of said ring sloping downwardly from said exterior diameter and inwardly toward said interior diameter, thereby to define an interior diameter rim which extends downwardly for at least a major circumferential portion thereof,

an inner disposed dome means attached to said outer disposed ring, said inner disposed dome having a diameter substantially smaller than said outer disposed ring to define a peanut seed feeding space therebetween,

seed drop cover means connecting said outer disposed ring and said inner disposed dome and having a substantial circumferential width, said seed drop cover means being disposed substantially above the level of the downwardly extending interior diameter rim, thereby to define a peanut seed exit volume beneath said seed drop cover means;

a floor plate disposed beneath said peanut hopper bottom and having a central opening therein adapted for receiving a drive shaft therethrough and having a generally annular shape, the top surface of which is disposed at least in very near proximity to the lower surface of said peanut hopper bottom, said floor plate including a seed drop aperture disposed below the seed drop cover of said peanut hopper bottom;

a rotating peanut seed plate having means for receiving rotational drive from the drive shaft extending through said floor plate and disposed on the top surface of said annular shaped floor plate and beneath said dome in the space defined therebetween, said seed plate having a major diameter corresponding to the interior diameter of said outer disposed ring and a minor diameter generally corresponding to the diameter of said dome disposed thereabove, with a downwardly sloping lateral surface disposed between the minor and major diameters, such that the sloping surface of said seed plate extends substantially between the lower surface of said inner disposed dome and the interior diameter rim of said outer disposed

ring, said seed plate having grooves radially disposed therearound on the sloping surface for receiving peanut seeds and upon rotation of said seed plate discharging the carried peanut seeds through the seed drop aperture of said floor plate; and

a taper gate extending from the seed drop cover of said peanut hopper bottom in a direction opposite to the rotational direction of said rotating seed plate, said taper gate having an inside radius substantially corresponding to that of the dome of said hopper bottom and disposed adjacently thereto and having a slightly larger outside radius with a center slightly offset from that of the inside radius to extend generally horizontally from the dome of said peanut hopper bottom in a curved path across the peanut feeding space to the outer disposed ring of the peanut hopper bottom, thereby to gate off a first portion of the peanut seeds from those being rotationally carried by said rotating seed plate, to permit a second portion of the peanut seeds to pass therebeneath into the peanut seed exit volume to the seed drop aperture of said floor plate for planting, and to channel the gated off peanut seeds for return to said rotating seed plate in a subsequent rotation.

4,545,512

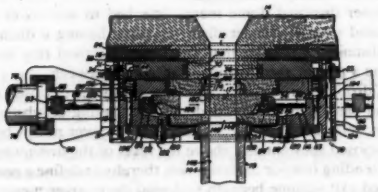
FULL THROTTLE VALVE AND METHOD OF TUBE AND GATE CHANGE

Earl P. Shapland, Sarasota, Fla., and Patrick D. King, Rantoul, Ill., assignors to USS Engineers & Consultants, Inc., Pittsburgh, Pa.

Division of Ser. No. 225,895, Jan. 19, 1981, Pat. No. 4,415,103, which is a continuation-in-part of Ser. No. 73,588, Sep. 7, 1979, which is a continuation-in-part of Ser. No. 945,441, Sep. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 732,867, Oct. 15, 1976, abandoned. This application Oct. 27, 1983, Ser. No. 525,867

Int. Cl.[4] B22D *41/08*

U.S. Cl. 222—600 **10 Claims**



1. A gate operative in valve apparatus of the type in which apertured gates are conveyed sequentially along a longitudinally extending guide structure into and out of flow controlling relation with the pour opening of a teeming vessel and wherein, in order to adjustably position said gates with respect to said pour opening for flow throttling purposes, said guide structure is movable transversely of the direction of movement of said gates along said guide structure, said gate comprising:

(a) a generally rectangular refractory body having a through opening defining a teeming orifice therein;

(b) means forming shoulders extending parallel to the longitudinal axis of said refractory body for engagement with said guide structure; and,

(c) said teeming orifice being disposed on a lateral axis of said refractory body in offset relation to said longitudinal axis, the extent of offset being in excess of the radius of said teeming orifice.

4,545,513

METERING DEVICE

Edgar A. Wood, Andrews, N.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 7, 1984, Ser. No. 609,509

Int. Cl.[4] G01F *11/24*

U.S. Cl. 222—632 **7 Claims**

1. A metering device comprising a housing having a top portion and a bottom portion, a material conveying chamber disposed in said bottom portion, said chamber having an air inlet and a chamber outlet for discharging air and material from said chamber, a metering disk disposed in said top portion and being adapted to oscillate in clockwise and counter clockwise direction said disk defining a first system of four openings extending therethrough and being distributed across the surface of said disk, a top plate superimposed over said metering disk said top plate defining a second system of four openings extending therethrough and being distributed across the surface of said top plate, a hopper for feeding material to said openings in said top plate, air supply means for directing air into said air inlet, and through said chamber, oscillating means operatively associated with said air supply means and said disk and adapted to oscillate said disk such that when two openings of said disk are in registering relation with two openings in said top plate for filling with material from said hopper, the other two openings in said disk discharge material to said chamber, said oscillating means being adapted to synchronously rotate said disk for discharging material to said chamber while activating said air supply means to supply air to said chamber to discharge said material through said chamber outlet.

4,545,514

METHOD AND APPARATUS FOR DISPLAYING GARMENTS

Malcolm D. Toy, 425 Willow Pl., Pittsburgh, Pa. 15218

Filed Mar. 8, 1983, Ser. No. 473,368

Int. Cl.[4] A41H *5/00*

U.S. Cl. 223—66 **20 Claims**

1. An upper garment display rack comprising,

an upper torso frame including a pair of upwardly extending torso members positioned in spaced relation, each of said torso members having an upper end portion and a lower end portion,

an open waist well extending transversely between said torso members and connected to said torso members lower end portion,

a shoulder member extending transversely above said torso members upper end portions,

shoulder pivot means for pivotally connecting said shoulder member to said torso members upper end portions for forward and backward movement of said shoulder member relative to said upper torso frame,

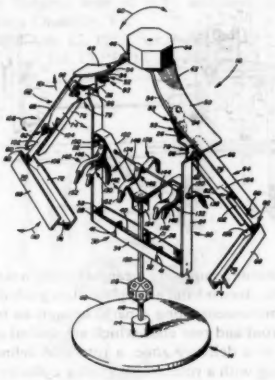
a pair of arm members positioned adjacently to said pair of torso members respectively,

each of said arm members having an upper portion and a lower portion, said upper and lower portions having adjacently positioned ends, said upper and lower portions

having supporting surfaces for receiving a garment to support the garment for display in a plurality of positions,

upper pivot carrying link means for connecting said arm members upper portions to said torso members upper portions for pivotal movement of said arm members upper portions in more than one direction relative to said torso members,

said arm members being pivotally movable independently of said shoulder member and said shoulder member being movable independently of said arm members such that said shoulder member and said arm members are capable



of being positioned in a plurality of positions independently of one another,

lower pivot carrying link means for connecting said adjacent ends of said arm members upper and lower portions for pivotal movement of said lower portions in more than one direction relative to said upper portions, and

said upper and lower pivot carrying link means being independently operable together with said shoulder pivot means to permit selective angular positioning of said shoulder member and said arm members relative to said upper torso frame.

4,545,515

SHEET CUTTING MACHINE

Vincent T. Kozyrski, Plainville, Conn., assignor to Fletcher-Terry Corporation, Farmington, Conn.

Filed Jul. 6, 1984, Ser. No. 628,498

Int. Cl.[4] B26D *7/27*; **B26F** *3/00*

U.S. Cl. 225—96.5 **20 Claims**

1. A cutting head for use in a manual sheet cutting machine, comprising:

A. an elongated body having a handle portion thereon and means for supporting said head for movement along a cutting path;

B. a cutter assembly including

(1) an elongated rocker arm having a head portion adjacent the forward end of said body, said rocker arm being pivotably mounted on said body for movement of said head portion between downwardly extended and upwardly retracted positions,

(2) a cutting member having a cutting element thereon,

(3) means for removably mounting said cutting member on said head portion of said rocker arm, said mounting means cooperating with said cutting member to permit slight longitudinal shifting of said cutting element in a forward direction and to bias said cutting member rearwardly against such shifting,

(4) means for biasing said rocker arm toward said extended position of said head portion, and

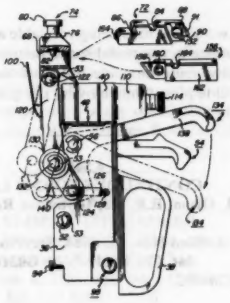
(5) first operating means on said body, accessible from said handle portion thereof and movable in one direction to elevate said rocker arm from said extended position toward said retracted position of said head portion against said biasing means, and movable in another direction to maintain said rocker arm in said extended position against upward deflection; and

C. a breaker assembly including

(1) a carriage pivotably mounted on said body and having a shaft portion extending transversely thereacross, said carriage being movable between downwardly extended and upwardly retracted positions of said shaft portion,

(2) a set of rollers rotatably mounted on said shaft portion, and comprising

(a) a generally cylindrical central roller having a shallow circumferential groove extending about the mid-section thereof to define thereon oppositely directed inwardly tapered generally conical sections, and



(b) a matched pair of outer rollers disposed outwardly of the ends of said central roller, said rollers being of a diameter larger than the maximum diameter of said central roller,

(3) means for biasing said carriage toward said retracted position of said shaft portion, and

(4) second operating means on said body, accessible from said handle portion thereof, for forcing said carriage toward said extended position against said biasing means; whereby said cutting head can be used for cutting glass, mat, and plastic sheet in a range of thicknesses, said mounting means of said cutter assembly serving to permit forward deflection of said cutting element by contact upon the edge of a sheet, at the commencement of a scoring operation, and to effect repositioning of said element to a point adjacent the edge, and said rollers serving to effectively break the sheet thereafter.

4,545,516

APPARATUS FOR CORRECTING ZIGZAG TRAVEL OF RUNNING SHEET

Masuo Miyai, Osaka, Japan, assignor to Toyo Machinery Co., Ltd., Osaka, Japan

Filed Aug. 13, 1984, Ser. No. 640,102

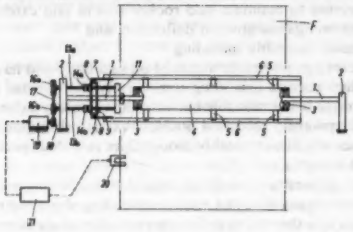
Claims priority, application Japan, Aug. 19, 1983, 58-152220

Int. Cl.[4] B65H *25/26*

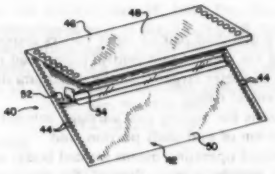
U.S. Cl. 226—20 **4 Claims**

1. An apparatus for correcting zigzag travel of a running sheet comprising a hollow cylindrical member rotatably supported on a shaft, a plurality of guide bars mounted on the cylindrical member as arranged radially therearound and slidable axially thereof, and an annular guide plate supporting one end of each guide bar by a roller so that zigzag travel of the running sheet can be corrected by the axial sliding movement of the guide bars due to an inclination of the guide plate and by the revolution of the guide bars around the shaft, the apparatus

being characterized in that two nuts are pivoted to side portions of the annular guide plate, a screw rod extending through each of the nuts in screw-thread engagement therewith, separate rotating means being mounted on the two rods individually, the two screw rods being rotatable at different speeds due to a difference in rotational speed between the rotating means and thereby made movable different distances to incline the annular guide plate while moving the guide plate axially of the shaft.



4,545,517
CONTINUOUS FORMS LEADER
William J. Olson, R.R. #3, Glynwood Rd., Wapakoneta, Ohio 45895
Filed Nov. 27, 1984, Ser. No. 675,157
Int. Cl.[4] B65H *5/28;* **G03D** *13/10*
U.S. Cl. 226—92 **6 Claims**



1. A forms leader for use in printing of business forms by a printing device having means for driving a form through said device including at least one tractor wheel having a plurality of drive pins carried thereon, the form being provided with a series of line holes spaced equidistantly along at least one edge thereof for engagement with said drive pins for driving of the form, said leader comprising:

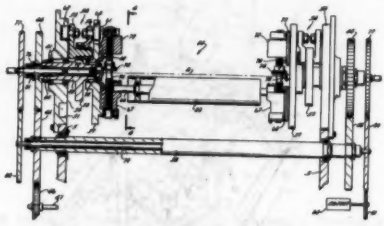
a rectangular sheet of flexible material of a width equal to the width of the form, said sheet having formed therein a series of line holes along at least one edge thereof spaced equidistantly with a relative spacing equal to the relative spacing between said line holes of the form;

said sheet being folded along a crease formed in said sheet across the width thereof, said crease being positioned to define a front portion of said sheet having a bottom edge and of less length than a rear portion of said sheet, said front and rear portions each having a front surface, said crease further being positioned so that each of said line holes formed on said front portion aligns with one of said line holes formed on said rear portion; and

an adhesive strip formed across said front surface of said rear portion of said sheet, said strip extending along at least a portion of said surface above a line thereon corresponding to said bottom edge of said front portion;

said adhesive being selected to have a relatively low tack whereby the form may be removably secured to said adhesive with said front portion extending over a portion of the form and said line holes of said sheet aligning with the line holes of the form.

4,545,518
WEB APPARATUS WITH VARIABLE REPEAT INTERVAL
Paul W. Bergland, Brookfield, Wis., assignor to Zerand Corporation, New Berlin, Wis.
Filed Nov. 26, 1984, Ser. No. 675,078
Int. Cl.[4] B65H *17/22;* **B14F** *13/04*
U.S. Cl. 226—139 **11 Claims**



1. Apparatus comprising means whereby a web of indeterminate length, drawn from a supply roll, is guided for lengthwise forward movement along a path through an impression zone that has front and rear ends which are spaced apart along said path and to a delivery zone, a rotatable delineating cylinder cooperating with a rotatable opposing cylinder to define a nip in said impression zone through which the web passes and at which the delineating cylinder produces uniform impressions on the web at uniform repeat intervals along it, said delineating cylinder having a cutout in its periphery to be out of contact with the web during an idle phase of each cycle of its rotation in which said cutout is juxtaposed to said opposing cylinder, the remainder of each said cycle being an advancing phase during which the delineating cylinder can produce an impression on the web, and drive means for rotating the delineating cylinder at a predetermined peripheral speed, said apparatus being characterized by:

A. a front pair and a rear pair of feed rollers, each said pair defining a nip through which the web passes to be fed forward by the pair, one feed roller of each said pair being rotatably driven from said drive means at a substantially steady rate such that the length of web fed forward by the pair during each said cycle is equal to the length of a repeat interval,

(1) said rear pair being located along said path between the supply roll and the rear end of the impression zone, and

(2) said front pair being located along said path between the front end of the impression zone and the delivery zone; and

B. front and rear cyclically operating means,

(1) each comprising

(a) a control roller about which the web is looped,

(b) a carrier by which the control roller is carried for cyclical bodily movement transverse to its length whereby the loop of web around the control roller is alternately increased and permitted to decrease, and

(c) transmission means drivingly connecting said carrier with said drive means and whereby said carrier is actuated to carry the control roller through a cycle of its bodily movement during each said cycle of the delineating cylinder,

(2) said front cyclically operating means being located along said path between said front end of the impression zone and said front pair of feed rollers, for constraining web in the impression zone to move forward at a speed equal to said peripheral speed all during each advancing phase and allowing the web in that zone to move rearward during each idle phase, and

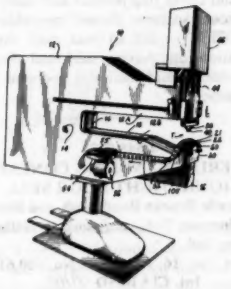
(3) said rear cyclically operating means being located along said path between said rear pair of feed rollers and the rear end of the impression zone, for allowing web in that zone to move forward all during each advancing phase and constraining web in that zone to move rearward through a predetermined distance during each idle phase.

4,545,519

METHOD AND APPARATUS FOR PREVENTING TIP STICKING DURING WELDING OPERATION

Theodore A. Renshaw, North Babylon, and Joseph A. Curatolo, Jr., Jackson Heights, both of N.Y., assignors to Fairchild Industries, Inc., Chantilly, Va.

Filed Apr. 12, 1983, Ser. No. 484,243
Int. Cl.[4] B23K *20/10*
U.S. Cl. 228—1.1 **5 Claims**



1. Ultrasonic vibratory spot welding apparatus of the type having a vibratory welding tip and a complimentary anvil both mounted on a stationary welding frame so as to define a throat into which workpieces may be inserted for welding, said vibratory welding tip comprising one end of a vibratory reed which is connected to a transducer adapted to transmit lateral vibrations and adapted to introduce into and through said workpieces a sufficient amount of high frequency vibratory energy in order to effect a weld between said workpieces, said apparatus including means for continuously inserting between said vibratory welding tip and said workpieces shim material having a hardness greater than the hardness of said workpieces, said shim material being adapted to be releasably welded to said workpieces in order to prevent vibratory welding tip sticking between said vibratory welding tip and said workpieces.

4,545,520

METHOD AND SYSTEM FOR SOLDERING INSULATION COATED PARTS

William C. Kent, Garland, Tex., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,882
Int. Cl.[4] H05K *13/00*; B23K *1/12*
U.S. Cl. 228—180.1 **8 Claims**

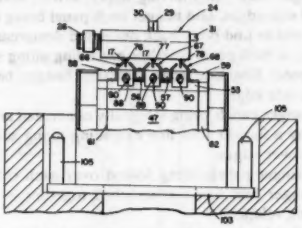
1. An apparatus for applying solder to a terminal extending downwardly from the underside of an article which comprises:

a housing having a solder well;

a pair of converging shield plates longitudinallly extending to overlay the well and having their respective top portions spaced apart to provide a longitudinally extending opening therebetween;

means for flowing molten solder through the well to divide the flow of solder into two elongated narrow streams respectively flowing up between the shield plates along two opposite longitudinal directions, each stream having a longitudinally extending exposed surface that projects slightly through the opening and rises above the level of the top portions of the shield plates without flowing over the sides of the shield plates;

first and second dam members located between the pair of shield plates proximate to opposite ends thereof, said dam members being adjustably secured to the housing for



independently controlling the flow rate of each one of the solder streams; and

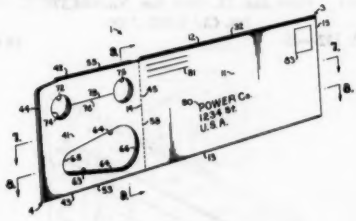
means for longitudinally advancing an article along a path parallel to the top portions of the shield plates to immerse the terminal in the solder streams flowing between the shield plates.

4,545,521

ENVELOPE WITH HANGER

Walter Hiersteiner, Shawnee Mission, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

Filed Jun. 8, 1984, Ser. No. 618,880
Int. Cl.[4] B65D *27/08*
U.S. Cl. 229—68 R **6 Claims**



1. An envelope adapted for attachment to one of a doorknob and a door handle, which comprises:

(a) a body including:

(1) a front panel with upper, lower, first side and second side edges;

(2) a back panel with upper, lower, first side and second side edges;

(3) said body panels being integrally connected at a body fold line extending along their lower edges;

(4) a side flap integrally connected to one of said body panels at a second side edge thereof and demarcated therefrom by a side flap fold line;

(5) a seal flap having proximate and distal edges, said seal flap being integrally connected to said body front panel and demarcated therefrom by a seal flap fold line extending along said body front panel upper edge and said seal flap proximate edge; and

(6) said body panels being folded over each other along said body panel fold line, said side flap being attached to the other of said body panels and said body panels being attached along their respective first side edges whereby a pocket is formed between said body panels; and

(b) a hanger including:

(1) a hanger front panel with upper, lower, first side and

second side edges, said hanger front panel being integrally connected to said body front panel and demarcated therefrom by a front panel tear line extending along said body front panel first side edge and said hanger front panel second side edge;

(2) a hanger back panel having upper, lower, first side and second side edges, said hanger back panel being integrally connected to said body back panel and demarcated therefrom by a back panel tear line extending along said body back panel first side edge and said hanger back panel second side edge;

(3) said hanger panels being integrally connected and demarcated by a hanger fold line extending along said hanger panel lower edges;

(4) said hanger panels being folded over each other along said hanger fold line and attached together in mutually opposing relation;

(5) a doorknob opening extending through said hanger panels and having a small first end in proximity to and spaced from said hanger panel first side edges, a large second end in proximity to and spaced from said hanger panel second side edges and a pair of side edges connecting said doorknob opening ends and converging toward said doorknob opening small end; and

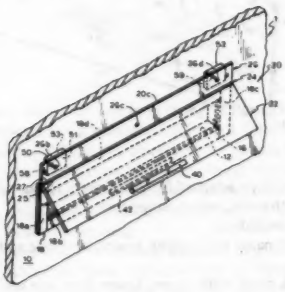
(6) a door handle opening extending through said extension panels and including a pair of spaced-apart receivers interconnected by a door handle opening tear line extending therebetween and adapted to pass a door handle into said receivers.

4,545,522

INDOOR MAIL SLOT COVER TO PREVENT HEAT LOSS THROUGH MAIL SLOTS

Gary D. Kerzner, 1044 Mora Pl., Woodmere, N.Y. 11598

Filed Jun. 25, 1984, Ser. No. 624,378
Int. Cl.[4] E05D 7/00
U.S. Cl. 232—45 **15 Claims**



1. An indoor mail slot cover that can be reduced in size prior to installation in accordance with the size of said mail slot and that can seal said mail slot by covering said mail slot and a weather-stripping arrangement installed about said mail slot directly on a building structure or on a mail slot bezel plate attached to a building structure, said cover comprising:

a plastic plate having:

a cover flap portion sized to cover said mail slot;

at least one transversely extending groove, located in at least said cover flap portion, said at least one transversely extending groove dividing said cover flap into a pair of adjacent sections;

a lug portion, spaced from said cover flap portion and located directly opposite thereto for connecting said plate to said building structure, said lug portion having at least a pair of separable lug sections, each of which is located opposite to a said second of said cover flap portion; and

a hinge portion located between said lug and said cover flap portions, said hinge portion comprising an integrally formed coined hinge having at least a pair of adjacent separable, hinge sections, each of which connects a said separable lug section to a said section of said cover flap portion; and

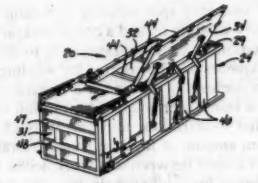
means for attaching at least a said lug section to said building structure, whereby when prior to installation one of said adjacent sections of said cover flap portion is of sufficient size to fully cover said mail slot and said weather-stripping arrangement, the other of said adjacent sections of said cover flap portion, simultaneously with a said hinge section and a said lug section connected thereto, can be broken off along the line of said at least one transversely extending groove and then discarded to thereby reduce the size of said cover flap portion and leave the remaining of said adjacent sections thereof operable for pivotable movement with respect to said mail slot between an opened position, uncovering said mail slot and a closed position, covering said mail slot and said weather-stripping arrangement.

4,545,523

WASTE MATERIAL HANDLING CONTAINER WITH LIQUID TIGHT DOOR SEAL

Donald E. Galbreath; Brooks Roudebush, and Robert N. O'Donnell, all of Winamac, Ind., assignors to Galbreath Incorporated, Winamac, Ind.

Filed Apr. 16, 1984, Ser. No. 600,615
Int. Cl.[4] B65D 90/00
U.S. Cl. 232—43.1 **6 Claims**



1. A liquid tight waste material handling container for sludges and other waste products, said container adapted to be transported to a waste generating site for loading and subsequently transported to a disposal site for unloading, and comprising, in combination:

(a) a body comprising a floor, a pair of opposed side walls, a front wall, and a roof;

(b) means for loading said body with waste material including liquid content;

(c) means defining a discharge opening at the end of said body remote from said front wall;

(d) an armored sealing frame member closed on all sides except for a longitudinal gap in one side thereof;

(e) a resilient sealing element enclosed within said armored sealing frame member except for said gap;

(f) a dump door hingedly attached to said body as a closure for said discharge opening, said dump door being attached to said body by side hinges and held closed by latches;

(g) a rigid continuous sealing rib fixed in liquid tight relation to the inside face of said dump door and adapted to register with said armored resilient sealing element through said armor gap upon closure of said door;

(h) and means for pressing said dump door and its sealing rib against said resilient sealing element to define a continuous liquid tight seal around said discharge opening;

(i) said pressing means for said dump door including first tensile adjustment means connected to said hinges and second tensile adjustment means connected to said latches

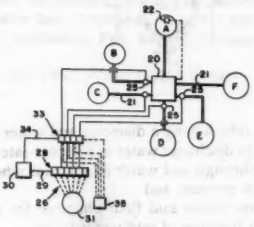
for maintaining uniform sealing pressure on said sealing element.

4,545,524

ZONE CONTROL APPARATUS FOR CENTRAL HEATING AND/OR COOLING SYSTEMS

Alex Zelczer, 3840 Severn Rd., Cleveland Hts., Ohio 44118

Filed Nov. 25, 1983, Ser. No. 554,952
Int. Cl.⁴ G05D *23/00*
U.S. Cl. 236—46 R **28 Claims**



1. In combination with a central heating and/or cooling system having a source of conditioned fluid controlled by a thermostat in one energizing circuit for the source of conditioned fluid and respective conduits for directing the conditioned fluid to respective zones for conditioning the environment thereof, a zone control apparatus comprising at least one flow control means operatively associated with a respective one of said conduits for controlling fluid flow therethrough, and a second energizing circuit for said flow control means separate and independent from said one energizing circuit, said second energizing circuit including cycle controller means for automatically cycling and actuating independently of the thermostat said flow control means between high and low flow conditions at preselected times.

4,545,525

PRODUCING LIQUID DROPLETS BEARING ELECTRICAL CHARGES

Kenneth S. Sachar, Brookline, and Stanley R. Rich, Wellesley Hills, both of Mass., assignors to Micropure, Incorporated, Natick, Mass.

Continuation of Ser. No. 512,745, Jul. 11, 1983, abandoned, which is a continuation of Ser. No. 278,661, Jun. 29, 1981, abandoned. This application Feb. 29, 1984, Ser. No. 584,647
Int. Cl.⁴ B05B *5/02*
U.S. Cl. 239—3 **4 Claims**

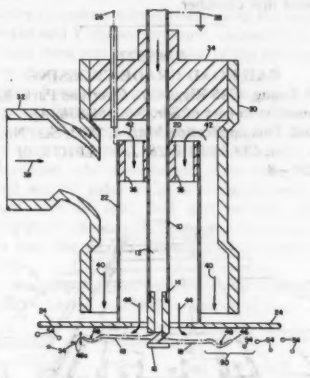
1. The method of producing electrically charged droplets of liquid which comprises the steps of:

forming said liquid into an unsupported flowing sheet which is bounded by a pair of surfaces,

producing in said sheet a downstream zone-of-instability extending a substantial distance in the direction of flow of said sheet in which said sheet becomes randomly unstable,

producing said droplets from the liquid in said zone-of-instability, and

inducing in said sheet an electrical charge with an electrode positioned near but spaced from a surface of said sheet and extending over a region including said sheet prior to said zone-of-instability, said zone-of-instability and said droplets after leaving said zone-of-instability, said electrode conforming in shape generally with the path of said flow, whereby to charge the liquid sheet electrostatically prior



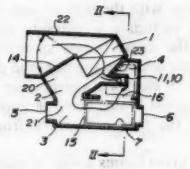
to said zone-of-instability and to maintain said charge on said droplets as they are formed.

4,545,526

AIR CONDITIONER FOR VEHICLE

Akinori Ido, and Goró Uchida, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Nippondenso Co., Ltd., both of, Japan

Filed Jun. 22, 1984, Ser. No. 623,437
Claims priority, application Japan, Jun. 27, 1983, 57-99270[U]
Int. Cl.⁴ B60H *1/02*
U.S. Cl. 237—12.3 A **13 Claims**



1. An air conditioner for a vehicle comprising:

a heater core for heating air blown from upstream thereof and for discharging heated air downctream thereof;

an air passage arranged in parallel with said heater core;

a first damper arranged upstream of said heater core and said air passage and being rotatable for controlling the amount of air passing through said heater core and the amount of air passing through said air passage in accordance with the rotational angle thereof;

a first chamber arranged downstream of said heater core and said air passage for mixing the heated air discharged from said heater core and non-heated air passed through said air passage, whereby to produce mixed air having a suitable temperature;

a second chamber provided downstream of said first chamber for distributing the mixed air to a ventilation diffuser formed at an instrument panel, whereby a passenger can get mixed air around his head;

a third chamber provided downstream of said second chamber and having at least one heater diffuser; and

at least one air bypass duct for directly connecting said first chamber and said third chamber, said bypass duct having an inlet in the downstream of said heater core and an outlet in said third chamber, whereby the passenger can get hot air from the heater diffuser around his legs and

rather cool air from the ventilation diffuser around his head even if said first damper is controlled to flow a large amount of non-heated air and a small amount of heated air into said first chamber.

4,545,527

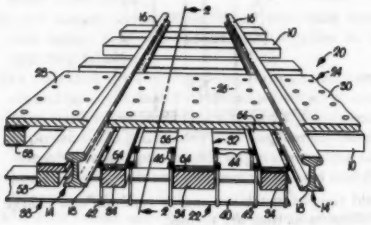
RAILROAD GRADE CROSSING

Thomas B. Young, 8745 Riggs Cir., Overland Park, Kans. 66212

Continuation-in-part of Ser. No. 366,836, Apr. 9, 1982, abandoned. This application Mar. 4, 1983, Ser. No. 472,014

Int. Cl.[4] **E01B** *7/28, 2/00;* **E01C** *9/04*

U.S. Cl. 238—8 **9 Claims**



1. In combination with a roadway having a roadbed, a series of elongated, spaced apart, non-metallic cross ties resting on said roadbed and a pair of elongated, spaced apart, metallic rails overlying and supported by said cross ties, each rail having an upper, wheel-supporting and guiding track, and a pair of opposed, lower, laterally-projecting, longitudinal flanges, a railroad grade crossing comprising:

grillage structure supported by said cross ties; and decking supported by said structure;

said decking having an upper, vehicular crossway substantially coplanar with the tops of said tracks,

said structure including a plurality of elongated, spaced apart, metallic cross beams spanning substantially the entire distance between the rails and disposed to preclude transmission of electrical currents across the rails,

certain of the cross beams being in underlying engagement with one of the rails and spaced from the other of said rails;

the remaining cross beams being in underlying engagement with said other rail and spaced from said one rail,

said certain cross beams alternating with said remaining cross beams.

4,545,528

SPRINKLER CONTROL SYSTEM

Paul S. Perez, 6844 First St. & Trans-Mountain, Canutillo, Tex. 79835

Filed Jun. 20, 1983, Ser. No. 505,953

Int. Cl.[4] **B05B** *1/02*

U.S. Cl. 239—1 **10 Claims**

1. A spray system for continuously sweeping a water spray over a selected area, comprising:

water spray forming means having a spray distance functionally related to water pressure,

a distribution header for delivering water to said spray forming means,

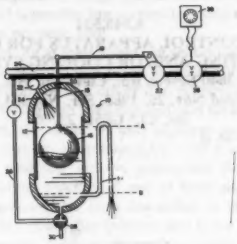
a valve for affecting water pressure within said distribution header to vary said spray distance, and

control means having a siphon for cycling a water level of said control means between two selected elevations and means responsive to said water level for actuating said valve to vary said water pressure,

said control means maintaining continuous water spray as said spray distance is varied, and further comprising

a float chamber having water inlet means and water outlet means for providing said water level elevation within said float chamber,

a siphon tube connected to said water outlet means and defining a first water level for initiating a siphon action and a second water level for admitting air to terminate said siphon action,



said siphon tube having a diameter and water exit elevation effective to discharge water at a higher rate than delivery of water through said water inlet means when said siphon action is in process, and

a float means within said float chamber for actuating said valve as a function of said water level.

4,545,529

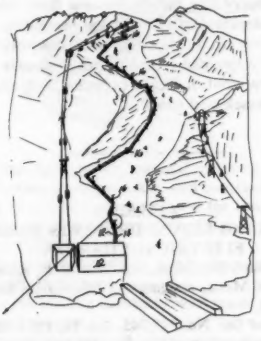
METHOD AND APPARATUS FOR AUTOMATICALLY MAKING SNOW

Joseph C. Tropeano; Joseph T. Tropeano, and Thomas F. Tropeano, all of 12 Revere St., Lexington, Mass. 02173

Filed Aug. 12, 1982, Ser. No. 407,535

Int. Cl.[4] **F25C** *3/04*

U.S. Cl. 239—2 S **5 Claims**



1. In an installation for making snow wherein a stream of compressed air and a stream of pressurized water are fed to the nozzles of snow-making equipment, a method for automatically controlling the flow of air and water to the snow-making equipment comprising the steps of:

providing at least one snow-making installation, a source of compressed air and a source of pressurized water;

sensing a predetermined ambient condition at said at least one snow-making installation;

feeding compressed air to said at least one snow-making installation in response to said sensed predetermined ambient condition;

automatically sensing the flow of compressed air to said at least one snow-making installation; feeding pressurized water to said at least one snow-making installation in response to said sensed compressed air flow; and

providing a temperature-sensitive flow control valve be-

tween said source of pressurized water and at least one snow-making installation for controlling the flow of water to said at least one snow-making installation in response to minor temperature changes such that the flow of water to said at least one snow-making installation increases upon a decrease in temperature and decreases upon an increase in temperature.

4,545,530

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

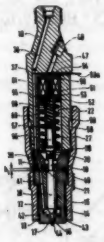
Karl Hofmann, Remseck, and Dietrich Trachte, Kornwestheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 404,807, Aug. 3, 1982, abandoned. This application Jun. 7, 1984, Ser. No. 617,845

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137761

Int. Cl.⁴ F16C *37/00;* **G01M** *15/00*

U.S. Cl. 239—73 **6 Claims**



1. A fuel injection nozzle for internal combustion engines, having a nozzle body in which a valve seat is formed, a valve needle cooperating with said valve seat is displaceably guided during opening and closing, said valve needle being acted upon by a closing spring and, in the opposite direction therefrom, by a fuel under pressure and upon an opening stroke moving counter to a flow direction of the fuel, a nozzle holder secured relative to said nozzle body by a sleeve nut, said nozzle holder including a chamber for receiving the closing spring and an induction coil, an armature influenced by said valve needle and associated with said induction coil for the purpose of producing a signal in accordance with the valve needle stroke, characterized in that a magnetic circuit of said induction coil leads via a body disposed axially adjacent the induction coil, which body is provided with a central bore having a wall, and said armature is embodied as a piston, which in the opening position of the valve needle protrudes to some distance into the bore, wherein the radial play between the wall of said body bore and the piston forms the smallest remnant air gap of the magnetic circuit.

4,545,531

WHEELED SPRAYING DEVICE

David A. Williams, Fremont, Calif., assignor to Aervoe-Pacific Company, Inc., San Leandro, Calif.

Filed Jul. 18, 1983, Ser. No. 514,831

Int. Cl.⁴ B05B *1/28;* **B67D** *5/64*

U.S. Cl. 239—150 **11 Claims**

1. A marking apparatus adapted for use with an aerosol spray can having a valve spray adapter and containing marking material, said apparatus comprising:

(a) wheeled base means for providing a moveable mounting surface and including:

a block Y-shaped upper surface structure formed by a transverse central member, equal-sized first and second rectangularly shaped arms extending forwardly of said transverse central member and interiorly spaced one from the other to form a U-shaped structure with said transverse member, and a third rectangularly shaped arm extending rearwardly of said central transverse member;

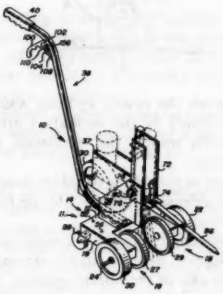
downwardly extending sides formed about the peripheral portions of said Y-shaped structure, except for the distal end of said third arm and a portion of the outboard side adjacent thereto;

axially aligned apertures in said downwardly extending sides of said first and second arms;

first and second axles extending through said axially aligned apertures in said first and second arms; and

first and second wheels mounted, respectively, on said first and second axles so as to be positioned on the outboard side of said first and second members, whereby the U-shaped space between the inboard sides of said first and second members is substantially preserved;

(b) means for supporting said paint can in an operable position on said wheeled base means, and including:



can holding means having a head adaptor for alignment of said can valve spray adapter in said can holding means; and

a moveable mounting bracket including means to mount said bracket in predetermined locations on said upper surface of said base, and further including a portion extending upwardly from said base and having positioning means adapted to accept said can holding means so that the can height above the surface to be marked and the angular relationship thereto may be adjusted, whereby the spray width angle of discharge may be preselected;

(c) drive means for applying a moving force to said wheeled base means;

(d) positioning means for setting the stripe width, marking angle and relationship of stripe path with respect to said wheeled based means; and

(e) means for selectively controlling the expulsion of material from said can.

4,545,532

ADJUSTABLE OSCILLATING FAN-JET SPRINKLER

Friedrich Schanz; Emil Schucker, both of Calw, and Alexander Perrot, Althengstett, all of Fed. Rep. of Germany, assignors to Perrot-Regnerbau GmbH & Co., Calw, Fed. Rep. of Germany

Filed May 26, 1982, Ser. No. 381,948

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121369

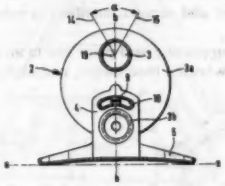
Int. Cl.⁴ B05B *3/16*

U.S. Cl. 239—242 **7 Claims**

1. An oscillating fan-jet sprinkler for the irrigation of a substantially rectangular area from a supply of pressurized water, the sprinkler having a housing with an inlet for pressurized water, a sprinkler stand supporting said housing while resting on a substantially horizontal supporting plane, an elon-

gated nozzle cylinder extending from the sprinkler housing in a generally horizontal direction, the nozzle cylinder being journalled in said housing for oscillation about its longitudinal axis, a row of nozzle bores on the upper side of an exposed portion of the nozzle cylinder defining a fantail pattern of spray jets within a spray plane, and oscillation drive means including a turbine wheel inside the sprinkler housing driven by the incoming pressurized water and drive translation means converting the rotary motion of the turbine wheel into a slow oscillatory motion of the nozzle cylinder, the improvement therein comprising:

means for angularly shifting the oscillation range of the nozzle cylinder by angularly adjusting the structural rela-



tionship between the nozzle cylinder and the sprinkler stand independently of the oscillation drive and of the drive translation means, the oscillation range shifting means including:

a housing support as part of the sprinkler stand, the sprinkler housing being releasably attached to the housing support by securing means; and

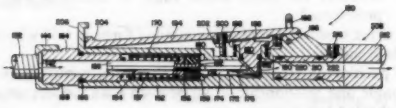
a rotational connection between the sprinkler housing and the housing support defining an adjustment axis which is parallel to the axis of the nozzle cylinder, the oscillation range of the nozzle cylinder being shiftable by adjusting the angular position of the sprinkler housing in its rotational connection to the housing support.

4,545,533

ABLUTION FAUCET

Irlin H. Botnick, Pepper Pike, Ohio, assignor to Josam Developments, Inc., Cleveland, Ohio

Filed Aug. 16, 1982, Ser. No. 408,449
Int. Cl.[4] B05B *15/06*
U.S. Cl. 239—282 **7 Claims**



1. In a hand-held unit for dispensing water for hygienic purposes, the combination comprising:

a body portion;

a water inlet for the body portion;

a nozzle extending outwardly of the body portion, the nozzle adapted to receive water transmitted through the body portion from the inlet and to discharge the water as may be directed by the user;

a valve element disposed within the body portion, the valve element oriented with respect to the flow of water so as to always be urged into engagement with a valve seat by water pressure;

a valve element-actuating member disposed at least partially within the body portion and in engagement with the valve element, the valve element-actuating member including a first piston movable generally perpendicular to the centerline of the body portion and a slide block in engagement with both the valve element and the piston, the slide block being disposed within the body portion;

means for orienting the slide block in a predetermined position relative to the body portion, said means including a plurality of ribs extending outwardly of the slide block, one of the ribs being configured differently than the others, and a groove formed in the body portion adapted to receive in sliding relationship the rib configured differently than the other ribs; and

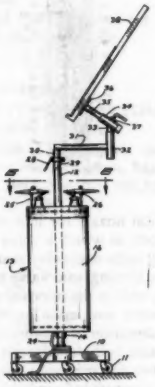
a control for the valve element-actuating member extending outwardly of the body portion, the control connected to the body portion such that the control moves generally perpendicular to the centerline of the body portion, actuation of the control causing the valve element to be axially displaced toward or away from the valve seat.

4,545,534

AIR BRUSH ORGANIZER

Gerald O. Schaefer, Shorewood Dr., Madison Lake, Minn. 56062

Filed Aug. 8, 1983, Ser. No. 521,138
Int. Cl.[4] B05B *9/02*
U.S. Cl. 239—286 **16 Claims**



1. An air brush organizer, for maintaining artists' air brushes in an orderly manner, which comprises:

(A) a vertical standard,

(B) a base for said standard,

(C) a housing supported on said standard spaced from the base, said standard extending above the top of the housing,

(D) a manifold within the housing, said manifold adapted for connection to a source of air under pressure,

(E) a recessed shelf, forming the top wall of the housing, for receiving and holding a plurality of air guns,

(F) a plurality of spaced openings in said housing top wall, each for passage of a length of flexible tubing extending from said manifold to an air gun,

(G) a test pattern easel mounted on said standard above the housing, and

(H) a vertical socket at the top end of said standard for receiving adaptive work-supporting accessories.

4,545,535

LIQUID METERING AND DISPENSING APPARATUS

Philip B. Knapp, 116 Stewart Ave., Amityville, N.Y. 11701

Continuation-in-part of Ser. No. 243,377, Mar. 13, 1981, Pat. No. 4,406,406. This application Sep. 26, 1983, Ser. No. 535,606
Int. Cl.[4] B05B *7/32*
U.S. Cl. 239—313 **8 Claims**

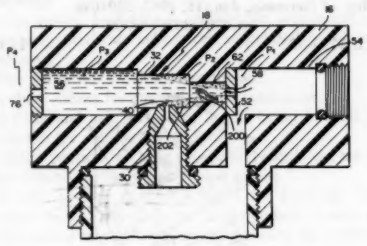
1. Apparatus for diluting and feeding liquid concentrate for

use with a source of water under pressure and liquid discharge means, said apparatus comprising a dispenser member and a pressure-sensitive container for said liquid concentrate removably mounted on said dispenser member and having a rigid nozzle provided with an outlet orifice,

said dispenser member comprising a metering head and a hollow casing removably mounted on said metering head,

said metering head having a water inlet opening adapted to be connected to said source of water, a water outlet opening adapted to be connected to said liquid discharge means, and a water conduit interconnecting said water inlet and outlet openings and comprising a through bore having an upstream end communicating with said inlet opening, a downstream end communicating with said outlet opening, and a mixing area between said ends,

said metering head also having an auxiliary fluid conduit communicating with the upstream end of said through bore and with the interior of said hollow casing, an opening communicating with the interior of the mixing area of said water conduit, and means for mounting said pressure-sensitive container on said metering head with said nozzle orifice communicating with said mixing area through said opening and with said pressure-sensitive container suspended within said hollow casing, whereby water under pressure supplied by said water source flows in a first path through said water conduit and through said mixing area thereof to said water outlet opening, and in a second path to the interior of said hollow casing, thereby filling said



hollow casing and applying head pressure to the pressure-sensitive container to feed the contained liquid concentrate therein through said outlet orifice into said mixing area,

said outlet orifice in said rigid nozzle being precisely dimensioned with a diameter sufficiently small to dispense liquid concentrate to mix with the stream of water flowing in said first path through said mixing area in a precise preselected micro-dispensing amount of parts of concentrate per million parts of water supplied by said water source,

said through bore being formed with a restricted passageway of reduced diameter upstream of said mixing area, said restricted passageway being formed of such diameter relative to the pressure of the water supplied by said source to provide a flow of water through said restricted opening from the upstream end thereof at such high velocity that its dynamic pressure reduces the total pressure to a value equal to the vapor pressure of the flowing water, thereby resulting in issuance of a high velocity stream of water from said restricted passageway in said first path surrounded by a low pressure vapor space,

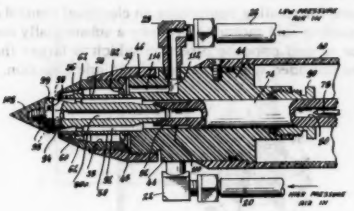
said restricted passageway being so located relative to said mixing area that said low pressure vapor space extends over said nozzle outlet orifice with the latter discharging into said vapor space, and providing a fixed flow ratio between the water main head pressure and the water vapor pressure for both the water flow and liquid concentrate flow, regardless of variations in the pressure of the water supplied by said water source.

4,545,536

APPARATUS FOR ELECTROSTATIC PAINT SPRAYING

Yakov Avidon, 2600 Park Ave., Apt. 3F, Bridgeport, Conn. 06604

Filed May 13, 1983, Ser. No. 494,185
Int. Cl.⁴ B05B *5/02*
U.S. Cl. 239—695 **7 Claims**



1. A liquid coating spray gun for coating workpieces with electrostatically charged droplets of the liquid, comprising:

a forwardly extending body member of electrically insulating material defining a forwardly extending elongated liquid delivery passage;

said liquid delivery passage having an input end at the rear of said body member connected to a source of the liquid coating and having a front end at the front of said body member;

an electrically conductive nozzle connected to the front end of said insulating body member and having a discharge passage therein receiving liquid flowing forward from the front end of said liquid delivery passage;

first air directing means for directing higher velocity air against liquid issuing from said discharge passage for atomizing said liquid into fine droplets;

second air directing means directing a second flow of lower velocity air against the atomized droplets for propelling them toward the workpiece;

a high voltage electrode positioned near the input end of said liquid delivery passage in contact with the liquid flowing forward in said passage for applying a high potential to the liquid near the input end of said elongated delivery passage;

said conductive nozzle being electrically insulated from said high voltage electrode by said insulating body member;

said conductive nozzle at an electrical potential lower than the potential of said electrode for reducing the hazard of sparking occurring when a workpiece and the nozzle are positioned relatively close to each other; and

said conductive nozzle having a sharp pointed surface near the liquid issuing from said discharge orifice for electrically charging the droplets being atomized by said higher velocity air.

4,545,537

SHREDDER WITH INCREASED REVERSED UNLOCKING TORQUE

Masahiro Kimura, Shiga; Yoshitaka Hayashi, and Ryohei Yoshida, both of Youkaichi, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Mar. 10, 1982, Ser. No. 356,924
Claims priority, application Japan, Mar. 11, 1981, 56-34413; Mar. 13, 1981, 56-36204
Int. Cl.⁴ B02C *25/00*
U.S. Cl. 241—36 **9 Claims**

1. A shredder comprising:

a pair of rotary cutters for shredding a material therebetween;

a speed reducer;

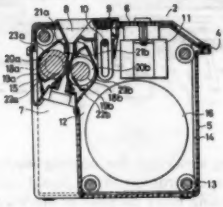
a motor mounted rotatable in one direction for rotating said rotary cutters through said speed reducer in one direction to shred the material and also rotatable in an opposite direction

for rotating said rotary cutters through said speed reducer in a reverse direction to unload the material from said rotary cutters;

a switch means for activating said motor to rotate selectively in said one and opposite directions; and

means connected to said motor for rotating said rotary cutters with a larger torque in said reverse direction than that in said normal direction,

said means for rotating comprising an electrical control circuit for enabling said motor to produce a substantially constant torque in said opposite direction which is larger than the torque provided when rotating in said one direction,



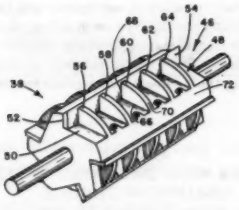
said electrical control circuit comprising a power supply, main and auxiliary windings of said motor connected in parallel to said power supply, and phase control means connected between said main and auxiliary windings for producing a difference between the phase of an electric current flowing through said main winding and the phase of an electric current flowing through said auxiliary winding, said motor providing said substantially constant torque as a function of said phase difference, said switch means being connected in said electrical control circuit to selectively connect said phase control means to said power supply such that said difference in phase is larger while said motor is rotating in said opposite direction than while said motor is rotating in said one direction.

4,545,538

HOG GRANULATOR

Stanley R. Prew, Montoursville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 29, 1983, Ser. No. 566,525
Int. Cl.[4] B02C *18/16*
U.S. Cl. 241—73 **12 Claims**



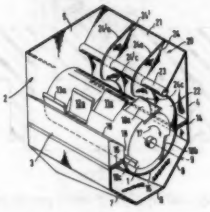
1. In a granulator for size reduction of a plastic material comprising a cutting chamber; a generally cylindrical rotor mounted within said cutting chamber for rotation about its longitudinal axis, said rotor having a plurality of spaced, longitudinally extending pockets cut out from its peripheral surface to permit heat dissipating air flow; a plurality of spaced, longitudinal knives peripherally fixed to said rotor, one of said knives being positioned adjacent each of said pockets; means for driving said rotor about its longitudinal axis; at least one bed knife situated for cooperative cutting relationship with said rotor knives as said rotor is driven to effect size reduction of plastic material fed into said chamber, wherein the improvement comprises a plurality of rib members spaced from one another at a distance of from about 4 inches to about 5 inches, said rib members each having a top surface of a sufficient width of at least about ¾ inch to avoid significant cutting of the plastic material to be reduced and extending across each of said pockets such that excessively large pieces of the plastic material to be reduced will be prevented from taking up residence in said pockets.

4,545,539

CUTTING MILL FOR THE COMMINUTION OF SYNTHETIC MATERIAL BODIES SUCH AS RUNNERS, INJECTION MOULDING PARTS, BLOWN MOULDING PARTS AND THE LIKE

Bjarne T. Steffensen, Odensevej 22, 5690 Tommerup, Denmark

Continuation of Ser. No. 372,811, Apr. 28, 1982, abandoned.
This application May 24, 1984, Ser. No. 613,760
Claims priority, application Denmark, May 7, 1981, 2024/81; Fed. Rep. of Germany, Jan. 15, 1982, 3201096
Int. Cl.[4] B02C *13/02*
U.S. Cl. 241—73 **14 Claims**



1. A cutting mill for the comminution of synthetic material bodies such as runners, injection moulding parts, blown moulding parts and the like comprising: a housing; a cylindrical rotor mounted for rotation in the housing; a plurality of mutually spaced cutting element groups arranged on the periphery of said rotor said cutting element groups comprising knives having knife edges substantially parallel with the axis of the rotor; at least one stationary blade, having a cutting edge substantially parallel with the axis of the rotor, and provided in the housing for cooperation with the knives of the cutting element groups; a sieve for filtering of the comminuted material extending over a part of the periphery of the rotor; means for gripping and precomminution of the material bodies before the stationary blade in an entry direction, said means including a plurality of guide plates, each guide plate having a narrow, generally curved lower input edge, each of the lower input edges extending from an area in proximity to the cutting edge of the stationary blade a substantialy distance along the periphery of the rotor and outside a peripheral path defined by the knife edges of the cutting elements of the rotor, the lower input edges being generally arcuately disposed with respect to the path defined by the knife edges of the cutting elements of the rotor, the guide plates being disposed substantially orthogonally to the knife edges and the axis of the rotor; and drive means for driving the rotor with a rotational speed of below 500 R.P.M.

4,545,540

APPARATUS FOR STORING MERCURY-CONTAINING USED PRODUCTS

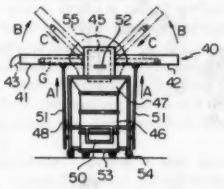
Akira Nakamura, 11-17 Tokiwadai 1-chome, Itabashi-ku, Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 524,038

Claims priority, application Japan, Sep. 8, 1982, 57-155276; Feb. 21, 1983, 58-26302; Mar. 28, 1983, 58-50525; Mar. 28, 1983, 58-50527

Int. Cl.⁴ B02C *19/14*

U.S. Cl. 241—99 **15 Claims**



1. An apparatus for destroying and storing used products containing injurious substances, comprising:

a housing for accommodating used products;

an inlet portion for receiving the used products;

means in said housing for crushing the used products in said housing;

suction means, including a passage for ventilation air, for drawing injurious substances suspended in air in said housing;

a filter for removing dust from the air;

adsorbent means for adsorbing said substances;

said filter and said adsorbent means being located in said passage for ventilating air; and

an outlet portion for exhausting said ventilating air after it has passed through said suction means,

said inlet portion including means for breaking the used products and directing the used product broken therein therealong toward said crushing means for crushing the broken used product, said breaking and directing means including two hollow guide arms having means for receiving therein a used product such that the used product is partially received in each of said two arms, at least one of said two arms being reciprocally vertically pivotable between a first position in which the used product is partially receivable in each of said two arms and a second position in which the used product is folded and broken by the pivotal movement of said at least one of said two arms.

4,545,541

MULTIPLE ROLL ROLLER MILL

Louis Jensen, London, Canada, assignor to Farmatic Inc., Ontario, Canada

Filed Jun. 27, 1983, Ser. No. 508,030

Claims priority, application Canada, Apr. 26, 1983, 426693

Int. Cl.⁴ B02C *4/08, 4/32*

U.S. Cl. 241—145 **13 Claims**

1. A roller mill comprising:

a frame having opposing sidewalls;

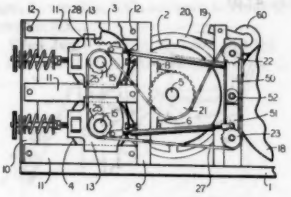
a main roller rotatably carried by said frame;

two secondary roller means each having a secondary roller and a shaft mounted for rotation between said opposing sidewalls in a pair of bearing means carried by said frame, each secondary roller opposing in spaced relation to a different axial portion of the circumference of said main roller so as to define axially separate mill sections for independently milling materials supplied separately to each of said axially separate mill sections;

adjustment means for independently adjusting the position of each secondary roller towards and away from the main roller; and,

drive means connected for driving at least said main roller;

the rotational axes of said secondary rollers being spaced vertically relative to each other and the shaft of at least one of said secondary roller means having a portion ex-



tending axially past the secondary roller of the other secondary roller means such that one bearing means for said at least one secondary roller means is carried by one of said frame sidewalls and the other bearing means for said at least one secondary roller means is carried by the other of said frame sidewalls.

4,545,542

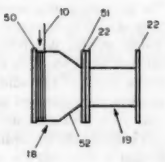
LIGHTGUIDE FIBER SPOOL CHANGEOVER TECHNIQUE

Ralph E. Frazee, Jr., Brick Township, Ocean County, N.J.; Daryl L. Myers, Lawrenceville, Ga., and David H. Smithgall, Sr., East Windsor Township, Mercer County, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Jun. 25, 1984, Ser. No. 623,881

Int. Cl.⁴ B65H *54/10, 67/04*

U.S. Cl. 242—18 A **5 Claims**



1. A method for dynamically transferring a strand of material from a full, rotating, take-up spool of strand material to an empty, rotating, take-up spool axially aligned therewith, comprising the steps of:

delivering the strand to a take-up spool at a substantially constant linear velocity;

winding the strand onto a rotating take-up spool in such a manner as to form a package of wound material having a conically tapered section when full;

rotating the full and empty spools at the same rotational velocity;

winding the strand along the tapered section, from the greater to the smaller cross-sectional diameter thereof, while simultaneously increasing the rotational velocities of both the full and empty spools; and

smoothly transferring the strand from the tapered section onto the empty spool when the strand is at the diameter of the taper equal to the diameter of the empty spool.

4,545,543

YARN FEED DEVICE

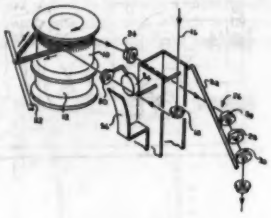
Derek W. Plucknett, Leicester, England, assignor to Triplite Limited, Leicester, England

Filed Apr. 17, 1984, Ser. No. 601,170

Claims priority, application United Kingdom, Apr. 27, 1983, 8311503

Int. Cl.[4] B65H *51/20;* **D04B** *15/48*

U.S. Cl. 242—47.01 **10 Claims**



1. A yarn feed device for intermittent positive feeding of yarn to textile machinery, comprising:

a capstan wheel for receiving a number of turns of yarn,

means for driving the capstan wheel at a speed synchronized with that of the textile machinery,

spaced first and second axial locations on said capstan wheel having different yarn engaging characteristics,

a yarn infeed guide for guiding the delivery of the said yarn to the capstan wheel,

a yarn outfeed guide for guiding the delivery of the said yarn from the capstan wheel,

means associated with the capstan wheel for axially separating successive turns of the said yarn on the wheel,

a yarn tension and overfeed detector in the yarn path of the said yarn downstream of the yarn outfeed guide, comprising movable yarn guide means and means lightly biasing the movable yarn guide means to draw a compliance loop in the said yarn downstream of the yarn outfeed guide to take up yarn overfed by the capstan wheel when the yarn demand by the textile machinery falls, and

pivotal lever means connecting the yarn infeed guide to the movable yarn guide means of the yarn tension and overfeed detector, for progressively moving the yarn infeed guide axially of the wheel in response to movement of the movable yarn guide means, whereby the yarn turns are positioned at said first axial location on the capstan wheel resulting in positive feed of the said yarn by the wheel when the yarn tension and overfeed detector senses a yarn tension in the said yarn downstream of the yarn outfeed guide sufficient to exhaust the compliance loop in the said yarn, indicating that a demand for the yarn exists, and whereby the yarn turns are positioned at said second axial location on the wheel resulting in free movement of the wheel within the yarn turns when the compliance loop of yarn is fully drawn, indicating that there is no demand for the yarn.

4,545,544

FABRIC HANDLING APPARATUS AND METHOD

John L. Rockerath, Voorhees, and Dale K. Blust, Stratford, both of N.J., assignors to Figge International, Inc., Richmond, Va.

Filed Sep. 10, 1982, Ser. No. 416,593

Int. Cl.[4] B65H *75/02;* **D05B** *21/00*

U.S. Cl. 242—55 **18 Claims**

1. A device for continuous supply of fabric comprising:

(a) a supply means to provide a continuous supply of fabric material,

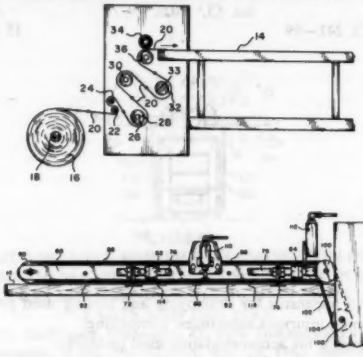
(b) nip roll means to intermittently pull the material at a certain rate of speed, and

(c) a fast feed roller means comprising at least two continuously rotating feed rollers, each roller rotating with the flow of the material, the rollers positioned to pressure contact the fabric on a surface area greater than about 180 degrees of the combined radial surface on the rollers,

wherein the feed rollers are operated at a rotating speed faster than the nip roll means pulling speed and have a coefficient of friction between the roll surface and the material to allow the rollers to slide over the fabric.

17. A method of supplying a continuous length of fabric comprising:

(a) pulling on an intermittent basis upon demand from an essentially continuous supply of fabric material,



(b) interposing between the supply source of the fabric and the device accomplishing the pulling; a fast feed roller means comprising at least two continually rotating feed rollers, each roller rotating with the flow of the material, the rollers positioned to pressure contact the fabric on a surface area greater than 180 degrees of the combined radial surface of the rollers,

wherein the feed rollers are operated at a rotating speed faster than the nip roll pulling speed, and have a low coefficient of friction between the roll surface of the material to allow the rollers to slide over the fabric surface.

4,545,545

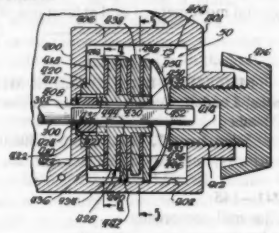
DRAG FOR SPINNING REELS

Richard R. Councilman, Collinsville, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 447,197, Dec. 6, 1982, abandoned, which is a continuation of Ser. No. 290,061, Aug. 4, 1981, abandoned. This application Jan. 5, 1984, Ser. No. 568,535

Int. Cl.[4] A01K *89/02*

U.S. Cl. 242—84.5 R **6 Claims**



1. In a fishing reel having a housing with a partition defining a pocket near one end thereof, a shaft in the housing extending into the pocket through an enlarged opening in the partition, the shaft having its rotation controlled by an improved drag mechanism comprising:

a drag driver in the pocket having at least a portion encircling the shaft immediately radially outwardly from the shaft and being spaced radially therefrom:

coupling means in the pocket including a portion spaced axially along the shaft relative to the drag driver portion and keyed to the shaft for rotation therewith:

means for clutchingly connecting the drag drive to the coupling means and being operatively driven by the coupling means, the drag driver having at least one radially outward extending disc member;

bushing means piloted in the opening in the pocket and having a bore spaced radially from the coupling means, the drag driver having a cylindrical portion piloted in the bore in the bushing means for supporting the drag driver in said radially spaced relationship to the shaft;

a washer member freely encircling a portion of the drag driver and being keyed to the housing against rotation, the washer member being movable in the axial direction toward and away from a radial surface on the disc member of the drag driver, the washer member having a surface radially of the shaft;

at least a pair of friction washers encircling the drag driver, one friction washer separating the disc member of the drag driver from the bushing means and the other friction washer separating the disc member from the washer member; and

means for selectively exerting a bias upon the washer member to create frictional interference between the surface of the disc member of the drag driver, friction washers and washer member producing a braking effect on the shaft;

whereby nutation of the shaft is allowed by reason of the spaced relationship between the shaft and said portion of the drag driver.

4,545,546

WEBBING TENSION DEVICE

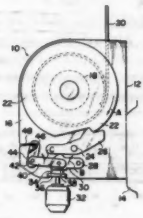
Teruhiko Kawaguchi, and Takayuki Ando, both of Niwa, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Jul. 20, 1983, Ser. No. 515,931

Claims priority, application Japan, Jul. 22, 1982, 57-111303[U]

Int. Cl.⁴ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107 **17 Claims**



1. A webbing tension device, capable of rotating an action wheel to wind an occupant restraining webbing on a webbing takeup shaft and capable of causing the occupant restraining webbing to secure an occupant tightly to enhance an occupant restraining performance in an emergency situation of a vehicle, which comprises:

(a) a pawl engaged with the action wheel to prevent the action wheel from rotating in a webbing winding direction;

(b) an action lever opposed to the pawl and separating the pawl from the action wheel when the action lever is rotated in a predetermined working direction thereof, said action lever having a normal at rest position, said rest position defining a line of action;

(c) a forcing means engaged with the action lever when the action lever is in normal position and tending to rotate it to one side of said line of action and in a direction opposite to its working direction; and

(d) an acceleration sensor opposed to the action lever operable during a vehicle emergency situation to move the action lever from its normal position thereof to the other side of said line of action, the forcing means being operable when said action lever is at said other side of said line of action to rotate the action lever rapidly in the working direction and to thereby cause disengagement of the pawl from the action wheel.

4,545,547

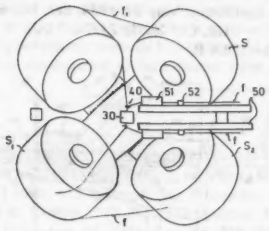
CREEL COMPONENT AND CREEL CONSISTING OF SEVERAL COMPONENTS

Hans S. Singer, Greenville, S.C., assignor to Hans S. Singer Co., Inc., Greenville, S.C.

Filed Jun. 11, 1984, Ser. No. 619,384

Int. Cl.⁴ B65H *49/02*; D02H *1/00*; D03J *5/08*

U.S. Cl. 242—131 **1 Claim**



1. A creel component for supporting a plurality of yarn package holders on the same horizontal level, and yarn guides located at a central point, said component comprising:

a plurality of bracket portions formed of flat base with yarn package holders mounted at a free upturned end of each bracket portion,

said yarn package holders being positioned such that the extended center line of the mounted yarn packages extends toward said central point; and

an extension of several of said upturned end of each said bracket portion having slot means and fasteners for adjustably attaching said extensions to each said end;

whereby said yarn package holders are vertically and outwardly adjustable on said upturned ends for accommodating various-sized packages.

4,545,548

EQUAL TENSION WIRE WINDING DEVICE

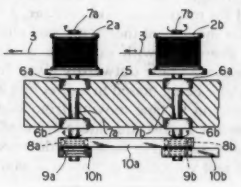
Taizo Kato, Toyota, and Toshiyuki Souchi, Inazawa, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 20, 1983, Ser. No. 533,971

Claims priority, application Japan, Oct. 26, 1982, 57-187734

Int. Cl.⁴ B65H *59/04*

U.S. Cl. 242—156 **3 Claims**



1. A wire winding device for maintaining equal tension in the wound wires comprising:

a base;

a plurality of revolving shafts juxtaposed to one another on the base and supporting wire reels on which wires are wound;

a plurality of pulleys each two of which are mounted to respective ones of the revolving shafts;

a plurality of braking belt means, each respectively and uniquely trained between pulleys of paired neighboring

reels, for producing sliding friction between said pulleys as said reels are payed out in opposite rotational directions within each of said pairs;

a take-up bobbin for winding thereon the plurality of wires payed out from the wire reels; and

a winder having a revolving shaft on which the take-up bobbin is mounted.

4,545,549

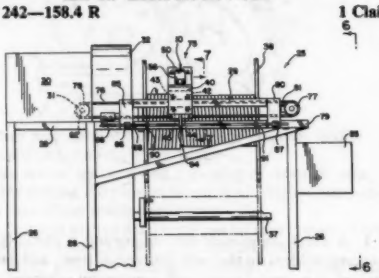
TAPE WINDING APPARATUS

John R. Rundo, Strongsville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 410,293, Aug. 23, 1982, Pat. No. 4,477,036. This application May 24, 1984, Ser. No. 614,080

Int. Cl.[4] B65H *23/16, 57/28*

U.S. Cl. 242—158.4 R **1 Claim**



1. An apparatus for winding a tacky sealant strip comprising support means, a guide rail mounted on said support means, a carriage mounted on said guide rail for reciprocal movement thereon, a drive means connected to said carriage for reciprocating said carriage on said rail, a tape guide member mounted on said carriage for directing sealant tape therethrough as said carriage traverses said guide rail, said tape guide member having a forwardly disposed end for receiving sealant tape and a discharge end for discharging sealant tape, a reel journaled on said support means operative to receive a tape for windup thereon from said tape guide member, drive means connected to said reel for rotating said reel to windup tape thereon, and said tape guide member including a tension control means, a slide bar is mounted on said support means, said slide bar having a pair of axially spaced stops, switch means mounted adjacent one end of said slide bar for selective contact therewith for controlling the direction of movement of said carriage, said carriage having a bifurcated plate moveable therewith and along the length of said slide bar and operative to selectively engage one or the other of said spaced stops to cause said slide bar to move into engagement with said switch means to actuate said switch to control the direction of movement of said carriage, said tension control means includes a wheel mounted for rotation on said carriage, a chute mounted on said wheel for movement therewith, said chute mounted on said wheel in alignment with said tape guide member and operative to discharge tape outwardly away from said guide member, said chute being biased in a direction away from said reel to apply tension to tape moving from said chute to said reel, motor control means are interconnected between said switch means and said drive means to decrease the speed of rotation of said reel with each actuation of said switch means.

4,545,550

TAPE REEL MOUNTING AND COUPLING FOR A MAGNETIC-TAPE CASSETTE

Joost M. Wolf; Hendrik A. Post; Willem H. Stigter; Gerard J. van der Brug, and Joannes H. F. C. Sieben, all of Groenewoudseweg 1, Eindhoven, Netherlands

Filed Aug. 29, 1983, Ser. No. 527,059

Claims priority, application Netherlands, Feb. 9, 1983, 8300476

Int. Cl.[4] G11B *15/32*

U.S. Cl. 242—200 **3 Claims**

1. A magnetic-tape cassette comprising a housing and adjacent reels, each of said reels being provided with a hub and flanges mounted for rotation within the housing, characterized in that the reels each comprise a first flange connected to the hub; a coupling member near said first flange, which coupling member comprises a first portion which extends axially outwardly into an aperture in the housing, and a plurality of limbs which extend axially opposite said first portion and are deflectable resiliently in a radially inward direction, said limbs being disposed inside said hub of the reel and arranged such that, responsive to placing the cassette on a magnetic tape apparatus having a reel disc and a winding mandrel, said limbs are engageable with the winding mandrel of the magnetic-tape apparatus; and a second flange connected to the hub and comprising an annular contact surface for positioning the reel on the reel disc of the magnetic-tape apparatus.

4,545,551

TRANSPORTING SYSTEM FOR VARIOUS KINDS OF COPS

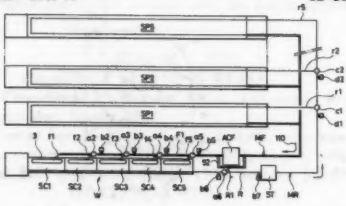
Hiroshi Uchida, 141-31, Aza Shimoyakeya, Horigami-cho, Oumihachiman-shi, Shiga-ken; Kazuo Nakanishi, B-4 Sekisuihouse Wakabadai, 6-27, Sunada, Iseda-cho, Uji-shi, Kyoto-fu; Masaharu Kiriake, No. 208 Muratadanchi, 47, Funato-cho, Kisshoin Minami-ku, Kyoto-shi, and Akira Shimano, 35, Mibukako-cho, Nakagyo-ku, Kyoto-shi, all of Japan

Filed Jul. 15, 1983, Ser. No. 514,102

Claims priority, application Japan, Jul. 19, 1982, 57-126542

Int. Cl.[4] B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **12 Claims**



1. A system for transporting different kinds of cops after fine spinning to a winder which includes a number of winding units therein and is divided into a plurality of winding sections in which different kinds of yarns are rewound, characterized in that said winder and a plurality of fine spinning frames for producing various kinds of yarns thereon are interconnected by supply means for supporting and transporting cops in an upright position along a main supplying passage and return means for supporting and transporting bobbins in an upright position along a returning passage, the supply means and the return means being common to the various kinds of yarns, said supply means and the individual sections of said winder are interconnected by branch supply means for supporting and transporting cops in an upright position along branch supplying passages, the branch supply means and the return means being interconnected by cop delivery means for supporting and transporting cops from the branch supply means to a winding unit where an unwinding operation occurs thereby forming bobbins and for supporting and transporting said bobbins to the return means, wherein cop discriminating sensors are disposed along the main supply passage adjacent to the branch supply passage and wherein cop selectors which are actuated by the cop discriminating sensors and which control

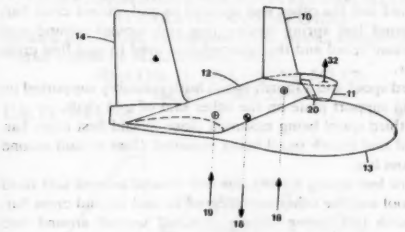
whether a cop travels along the main supply passage or along a particular branch supply passage are disposed along the main supply passage adjacent the particular branch supply passage.

4,545,552

AIRFRAME DESIGN

Stanley W. Welles, 12980 Knight Ct., Broomfield, Colo. 80020

Filed Jun. 20, 1983, Ser. No. 505,831
Int. Cl.[4] B64C *5/08*
U.S. Cl. 244—90 R **3 Claims**



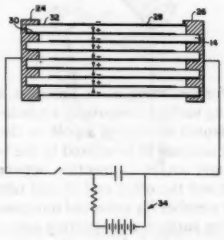
1. An airframe of the flying wing configuration comprising:
a swept forward wing with controllable wing tip extensions extending into the wing tip vortices at the ends thereof, said wing tip extensions comprising a first, downwardly extending winglet located forwardly of a spanwise wing centerline, a second, upwardly extending winglet located rearwardly of a spanwise wing centerline, said first and second winglets being independently controllable about a chordwise axis, said first and second winglets being further independently controllable about an axis extending spanwise of said winglets, wherein said winglets consitute the primary control of pitch, roll and yaw of said airframe.

4,545,553

PIEZOELECTRIC DEICING DEVICE

Robert C. Finke, Westlake, and Bruce A. Banks, Olmsted Township, Cuyahoga County, both of Ohio, assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 469,867, Feb. 25, 1983, abandoned. This application Aug. 7, 1984, Ser. No. 638,541
Int. Cl.[4] B64D *15/18*
U.S. Cl. 244—134 D **3 Claims**



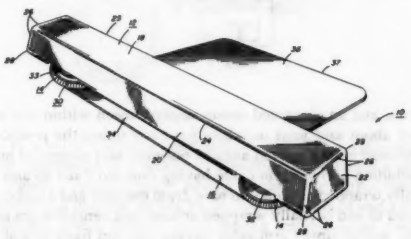
1. Apparatus for removing ice from an aircraft wing comprising
a transducer for covering the leading edge of said aircraft wing, said transducer comprising
multiple sheets of alternately polarized piezoelectric polymeric material bonded together to form a composite, each of said sheets being metallized on both surfaces, and
a pair of spaced metallized terminals, one of said terminals being in electrical contact with one of said metallized surfaces of each of said sheets and the other of said terminals being in electrical contact with the other of said metallized surfaces on each of said sheets,
means for restraining oppositely disposed edges of said composite from movement while providing freedom of movement of the central portion thereof,
a direct current electrical power supply,
means for selectively connecting said electrical power supply to said spaced terminals for applying a fast voltage pulse thereto so that a positive electrical charge is placed on said one of said terminals and a negative electrical charge is placed on said other of said terminals thereby producing a sheet lengthening piezoelectric strain in said sheets to cause the unrestrained central portion of said composite to move forward away from said aircraft wing so long as said fast voltage pulse is maintained, and
a cover of a polymeric material bonded to said composite for protecting the exposed surface thereof from particle damage.

4,545,554

WRIST SUPPORT FOR USE WITH AN OFFICE MACHINE HAVING A KEYBOARD

Richard M. Latino, 473 Burncoat St., Worcester, Mass. 01606, and David K. Crabbe, P.O. Box 122, Auburn, Mass. 01501

Filed Aug. 31, 1981, Ser. No. 298,134
Int. Cl.[4] B43L *15/00*
U.S. Cl. 248—118.1 **6 Claims**



1. A wrist support for use with a keyboard, comprising a base, an elongate support bar having a top and bottom surface, first and second spaced apart rotatable means, means for securing said first and second rotatable means to said base for preventing axial movement therebetween while permitting rotational movement relative thereto, said first and second rotatable means each including a cylindrical portion having an exterior threaded surface, and a knob operable separately from said securing means, disposed adjacent to said base and fixedly connected at a first end of said cylindrical portion, said bottom surface of said support bar having therethrough an internally threaded bore which extends axially from said bottom surface toward though not to said top surface, said bore being sized to receive a second end of said cylindrical portion in threaded engagement therewith, wherein manual rotation of said knob turns said cylindrical portions therewith relative to the support bar causing the support bar to screw or unscrew on the cylindrical portions, and thereby adjusts the height of the support bar relative to the base without disassembly therefrom.

4,545,555

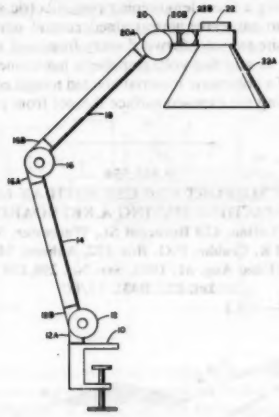
ADJUSTABLE ARM MEMBER FOR USE WITH A LAMP OR THE LIKE

Mark B. Koch, 203 W. 103rd St. #4B, New York, N.Y. 10025

Filed Jul. 2, 1984, Ser. No. 627,183
Int. Cl.[4] A47F *5/13*
U.S. Cl. 248—280.1 **5 Claims**

1. An adjustable arm comprising: a base member; a base rotatable joint member connected to said base member, said base rotatable joint member including a base housing and a

base drum member fixed to said housing; a lower arm having one end connected to said base rotatable joint member; a central joint member connected to the other end of said lower arm, said central joint member including a central housing and a freely-rotatable central drum member in said housing; an upper arm having one end connected to said central joint member; a head joint member connected to the other end of said upper arm; said head joint member including a head housing and a head drum member fixed in said housing; each of said drum members having an axis orthogonal to the axes of said



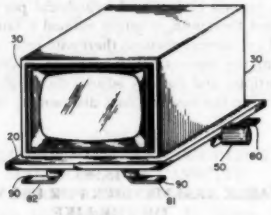
arms; and an elongated means under tension within said arms and about said joint members for maintaining the position of the head end in a given angular position, said elongated means including a lower arm cable having one end fixed to and partially wrapped around said base drum member and another end fixed to and partially wrapped around said central drum member, and an upper arm cable having one end fixed to and partially wrapped around said central drum member and another end fixed to and partially wrapped around said head drum member.

4,545,556

TERMINAL ELEVATING MECHANISM

Kevin S. Buist, New Brunswick, and Thomas A. Kachnowski, Flemington, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 5, 1983, Ser. No. 520,837
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—346 **1 Claim**



1. A terminal lifting apparatus comprising

a large-area support plate having a top surface which carries a terminal, and a bottom surface which is adapted to be disposed adjacent to a support table,

a first cross bar and a second cross bar mounted parallel to each other adjacent to the lower surface of said plate,

a threaded shaft coupled to said first and second cross bars for driving them toward and away from each other, said cross bars being transverse to said shaft,

a first spool and a second spool, both rotatably supported on said support plate on one side of said shaft,

said first spool being mounted close to said first cross bar and said second spool being mounted close to said second cross bar,

a first leaf spring having one end wound around said first spool and the other end secured to said second cross bar,

a second leaf spring having one end wound around said second spool and the other end secured to said first cross bar,

a third spool and a fourth spool, both rotatably supported on said support plate on the other said of said shaft,

said third spool being mounted close to said first cross bar, and said fourth spool being mounted close to said second cross bar,

a third leaf spring having one end wound around said third spool and the other end secured to said second cross bar,

a fourth leaf spring having one end wound around said fourth spool and the other end secured to said first cross bar, and

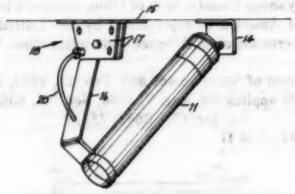
a plurality of support legs pivotably secured to said support plate in front of said cross bars and resting on said cross bars so that, as the cross bars are driven toward and away from each other, the legs pivot and bear against a support table to raise and lower the terminal with respect to the user.

4,545,557

ARTICULATED MOUNTING MEANS FOR POLES, ANTENNAS AND THE LIKE

Bernard J. D. Rogers, 52 Hewitt Way, Booragoon, Western Australia, Australia

Filed Jul. 22, 1983, Ser. No. 516,547
Int. Cl.[4] A01K *97/10*
U.S. Cl. 248—516 **1 Claim**



1. A device for mounting poles, antennas, and the like on a vertical mounting surface comprising a tubular member having an open end adapted to receive a pole or the like, a first supporting bracket adapted to be affixed to the vertical mounting surface, a ball and socket connection between said first supporting bracket and the other end of said tubular for supporting said tubular member for universal movement relative to the vertical mounting surface, a supporting arm one end of which is rigidly affixed to said tubular member adjacent the open end thereof, a second supporting bracket adapted to be spaced apart from and adapted to be attached to the same vertical surface as said first supporting bracket, said second bracket comprising a pair of spaced apart plates, the other end of said arm extending between said plates of said second bracket and being pivotally connected to said second supporting bracket for movement of said tubular member from a vertical position adjacent and substantially parallel to the vertical mounting surface through intermediate positions in which said tubular member project laterally outwardly and upwardly from the vertical mounting surface to a horizontal position adjacent to

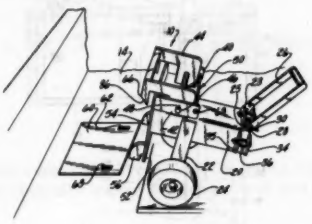
and parallel to the vertical mounting surface and means for detachably locking said arm in the desired position with respect to said second supporting bracket for positioning said tubular member in selected positions comprising a plurality of spaced pairs of holes extending through said plates, a corresponding hole extending through said other end of said arm and pin means adapted to extend through selected of said pairs of holes and said arm hole.

4,545,558

PLATFORM SUSPENDING DAVIT MOUNTING APPARATUS AND METHOD

Richard E. Crudele, Farmington Hills, Mich., assignor to Powered Platforms Mfg., Livonia, Mich.

Filed Oct. 31, 1983, Ser. No. 547,370
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—544 **9 Claims**



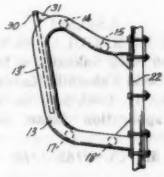
1. A socket removably mounted to a pedestal for mounting a davit useful for suspending a platform over the side of a building comprising:
   a housing having a first and second end adapted to slidably receive said davit through said first end;
   a plate affixed to said second housing end;
   a pair of pedestal engaging hooks affixed to said plate; and
   a locking clamp for releasably connecting said socket to said pedestal.

4,545,559

OUTBOARD MOTOR SUPPORT BRACKET

James C. Gilbreath, 26225 Big Pines Hwy., Wrightwood, Calif. 92397

Filed May 9, 1984, Ser. No. 608,376
Int. Cl.⁴ F16M *1/00*
U.S. Cl. 248—642 **6 Claims**



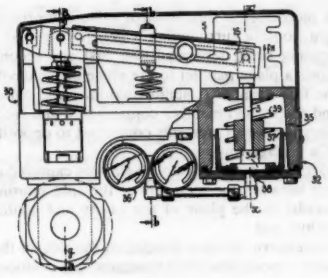
1. A one-piece outboard motor support bracket for securing a motor mount to the transom of a boat, comprising:
   a pair of frame members, each frame member being formed in a substantially U-shape having two leg portions joined by an intermediate closed end portion, transom mounting pads integrally united to the free ends of said leg portions of respective ones of said frame members, motor mounting pads adjacent respective ones of said closed end portions of respective ones of said U-shaped frame members, said motor mounting pads extending in spaced relationship to said transom mounting pads for supporting an outboard motor mount at a fixed predetermined angle relative to the boat transom, and strut means for maintaining said frame members in fixed laterally spaced apart relation, the motor mounting pads being secured at fixed predetermined vertical level relative to the transom pads to hold the outboard motor a fixed level above the water line of the boat.

4,545,560

VALVE COUPLING

Luc Marcadet, Noyers sur Cher, and Michel Ozanne, Proussy, both of France, assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 14, 1983, Ser. No. 474,763
Claims priority, application France, Mar. 24, 1982, 82 05024
Int. Cl.⁴ F16K *31/124, 37/00*
U.S. Cl. 251—58 **5 Claims**

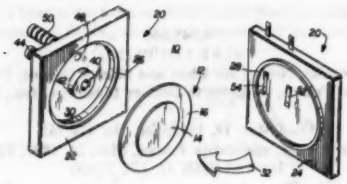


1. In a valve assembly combination, including a valve positioner responsive to a measured condition for emitting a control signal, a valve actuator having displaceable output means operable to a position setting by the control signal of said valve positioner, and a control valve having settable input means operably adjustable for regulating fluid flow through the valve in correlation with the position setting of said valve actuator output means, a coupling linkage forming a driving connection between said valve actuator output means and the settable input means of said control valve enabling adjustment of the flow coefficient of the control valve independent of the signal emitted by said valve positioner, said coupling linkage comprising in combination:
   (a) an elongated first arm extending between a first fixed pivot axis and a connection with the displaceable output means of said valve actuator, said first arm being subject to arcuate displacement about said first pivot axis concomitantly in response to a change incurred in the position setting of the output means of said valve actuator;
   (b) an elongated second arm extending between a second fixed pivot axis and a connection with the settable input means of said control valve, said second arm being adapted when actuated to incur an arcuate displacement about said second pivot axis while concomitantly adjusting the settable input means of said control valve; and
   (c) connection means joining said first and second arms at a predetermined location to afford relative pivotal motion of said arms thereat and effective when said first arm is arcuately displaced about said first pivot axis to actuate displacement of said second arm about said second pivot axis, said connection means being adjustably presettable to said predetermined location at which the relative amplitudes between the position setting of said actuator output means and the actuated input of said second arm to the settable input means of said control valve is effected for an intended regulation of flow through said control valve.

4,545,561
PIEZOELECTRIC VALVE OPERATOR

Henry C. Brown, Dallas, Tex., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation of Ser. No. 403,813, Jul. 30, 1982, abandoned. This application Oct. 4, 1984, Ser. No. 657,473
Int. Cl.[4] F16K *31/04*; H01L *41/08*
U.S. Cl. 251—129.08 4 Claims



1. A piezoelectric fluid control valve comprising:

a split housing surrounding a generally planar cavity, the housing being separated into first and second members along a plane parallel to the plane of the cavity in which the first member contains fluid inlet and outlet apertures and the second member contains first and second flexible electric contact elements connected to opposite terminals of a voltage source;

a deformable conductive plate element captured at its perimeter between the members of the split housing, oriented parallel to the plane of the cavity and contained therewithin; and

a piezoelectric element bonded to the side of the plate element opposite the fluid apertures in a position proximate to the center of the plate element such that the piezoelectric element is supported by the plate element without contacting the housing at its perimeter,

wherein the first flexible electric contact element presses against the piezoelectric element and the second flexible electric contact element presses against the deformable conductive plate such that the plate is caused upon actuation of the piezoelectric element by the voltage source to travel between a first position in which the plate occludes the passage of fluid between at least one of the fluid apertures and the cavity and a second position in which the plate is deformed away from the at least one aperture, allowing fluid flow through the cavity between the inlet and outlet apertures.

4,545,562
DEVICE FOR ELIMINATION OF VIBRATIONS OF A VALVE FOR DECOMPRESSION OF AN ENCLOSURE

René Feurgard, La Celle St-Cloud, and Jacques Baujat, Versailles, both of France, assignors to Framatome & Cie, Courbevoie, France

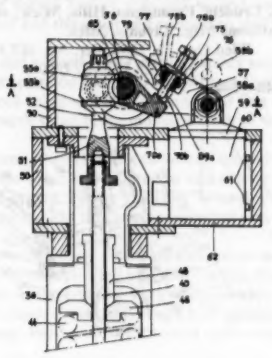
Filed Jun. 28, 1983, Ser. No. 508,706
Claims priority, application France, Jul. 1, 1982, 82 1157
Int. Cl.[4] F16K *31/02*
U.S. Cl. 251—129.20 5 Claims

1. In a valve for decompression of an enclosure containing a fluid under pressure and comprising a valve body mounted on the enclosure and communicating with an opening of the latter; a seat formed in said valve body and defining a passage between said opening and a discharge passage; a valve closure gate mounted for movement toward and away from said seat in said valve body; a stem fixed to said valve gate at one end thereof and guided in said valve body for movement toward and away from said valve seat along with said valve gate; spring means compressed between said valve body and said stem for exerting on said valve steam a force sufficient for maintaining the valve gate on said seat as long as the pressure inside said enclosure and acting on said valve gate remains below a predetermined limit value;

a device for elimination of vibrations of said valve comprising;

(a) a lever having a first part connected with said valve body for pivotal movement about an axis transverse to the direction of movement of said stem, having a two-way abutting connection with said stem and having a second part connected with said valve body for pivotal movement about the same axis as said first part;

(b) electromagnetic means having a movable armature connected to said second part and actuatable for retaining said second part in a predetermined position in which said valve gate is clear of said valve seat when energized;



(c) a friction coupling for rotatable frictional connection between said first and second parts;

(d) a rocker arm fast with said first part; and

(e) a bearing surface provided on said second part along the path of said rocker arm upon relative pivotal movement of said first part and second part, engageable by said rocker arm for providing an abutting connection between said first part and second part upon return of said valve gate onto said valve seat.

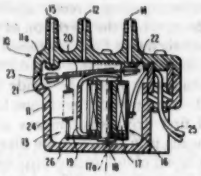
4,545,563
PRESSURE REGULATOR VALVE

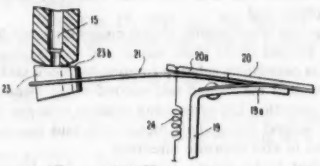
Hiroaki Morioka, and Naoji Sakakibara, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Sep. 19, 1983, Ser. No. 533,729
Claims priority, application Japan, Sep. 17, 1982, 57-141679[U]
Int. Cl.[4] F16K *1/18*
U.S. Cl. 251—298 1 Claim

1. A pressure regulator valve assembly comprising a casing having a chamber therein, at least one port provided in said casing in communication with said chamber, a valve seat surrounding said port and located within said chamber, a valve element engageable with said valve seat, an elastic plate having means for securing said valve element to said plate, said valve element being provided with a flat sealing surface inclined relative to said elastic plate, means for preventing rotation of said valve element relative to said elastic support plate being comprised of a rectilinear hole formed in said elastic support plate for the reception of a complementary projection on said valve element to maintain the proper orientation of said inclined sealing surface relative to said valve seat, and means for moving said elastic plate to bring said valve element into and

out of engagement with said valve seat whereby upon movement of said elastic plate to bring said valve element into





engagement with said valve seat said flat sealing surface will be disposed in parallel sealing engagement with said valve seat.

4,545,564

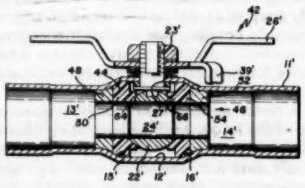
VALVE

Joseph D. Krosoczka, 10 Brookline St., Worcester, Mass. 01603, and Carl Cervini, 37 Juniper La., Holden, Mass. 01520

Continuation-in-part of Ser. No. 416,503, Sep. 10, 1982, abandoned. This application Mar. 15, 1983, Ser. No. 475,548

Int. Cl.⁴ F16K *5/06*

U.S. Cl. 251—315 **2 Claims**



1. Valve comprising:

(a) a main unitary housing which is integrally formed of malleable metal, said housing having a circular central cavity, a circular inlet passage at one end of the cavity and a circular outlet passage at the opposite end of the cavity, each of said passages having a substantially smaller cross-sectional area than said cavity, said housing having a first inner frusto-conical surface which defines a first transition passage between the central cavity and the inlet passage, and a second inner frusto-conical surface which defines a second transition passage between the central cavity and the outlet passage,

(b) a flow control ball located in said cavity and having a bore,

(c) a first retaining ring located in a fixed position between the inlet passage and said ball and spaced from the ball, at least a portion of each of said first retaining ring being located in said first transition passage and extending to the outer limits of said first transition passage,

(d) a seond retaining ring located in a fixed position between the outlet passage and said ball and spaced from the ball, at least a portion of each of said second retaining ring being located in said second transition passage and extending to the outer limits of said second transition passage,

(e) a first sealing ring of elastomeric material located in the cavity between the first retaining ring and the ball, one side of said first sealing ring being in engagement with said first retaining ring and the opposite side of said first sealing ring having a first ball seat which is in sealing engagement with said ball, at least a portion of said first sealing ring being located in said first transition passage extending to the outer limits of said first transition passage to form with the ball, a complete seal between the cavity and the inlet passage,

(f) a second sealing ring of elastomeric material located in the cavity between the second retaining ring and the ball, one side of said second sealing ring being in engagement with said second retaining ring and the opposite side of said second sealing ring having a second ball seat which is in sealing engagement with said ball, at least a portion of said second sealing ring being located in said second transition passage extending to the outer limits of said second transition passage to form with the ball, a complete seal between the cavity and the outlet passage, each of said first and second retaining rings and said first and second sealing rings having an outer frusto-conical surface for engaging the corresponding portions of said first and second frusto-conical inner surfaces, and

(g) actuating means for rotating the ball from a closed position in which the bore of the ball is out of alignment with said inlet and outlet passages to an open position in which the bore of the ball is aligned with said inlet and outlet passages.

4,545,565

DIAPHRAGM VALVE

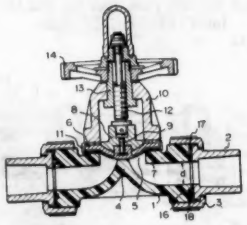
Nichiro Sano, and Kazuhiko Tsuno, both of Nobeoka, Japan, assignors to Asahi Yukizai Kogyo Co., Ltd., Japan

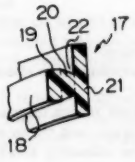
Filed Jun. 20, 1984, Ser. No. 622,739

Claims priority, application Japan, Dec. 8, 1983, 58-188583[U]

Int. Cl.⁴ F16K *7/16;* **F16L** *17/06*

U.S. Cl. 251—331 **4 Claims**





1. A diaphragm valve comprising a valve body having an upstream and a downstream end, a body cap on each said upstream and downstream end, piping on each said end, a diaphragm means for controlling a rate of liquid flow through the valve located intermediate each said end and means for providing a water-tight seal between said valve body and said body caps comprising an annular groove recessed in an end

surface of each end of one of said valve body and a body cap, and packing rings each having an annular base with an annular protrusion on a surface of said annular base fitting into each of said annular grooves; each said protrusion having a cross-sectional configuration in the shape of a rectangle connected by a converging trapezoid to said base surface, and each said packing ring having an inner diameter equal to the inner diameter of said valve body.

4,545,566

METAL SEALS FOR DAMPER BLADES

Fred R. Kammerer, Mt. Vernon, N.Y., assignor to Accurate Metal Weather Strip Company, Mt. Vernon, N.Y.

Filed Mar. 16, 1984, Ser. No. 590,527
Int. Cl.[4] F24F *13/08*
U.S. Cl. 251—357 **6 Claims**

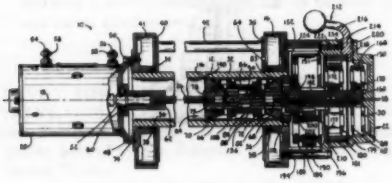
1. A metal seal constituted by a rolled strip of metal formed to include a pair of opposite sides and a bottom defining a U-shaped portion, a hook portion extending inwardly from the free end of one of said sides toward the bottom of the U, and a sealing flap reversely bent to extend away from the end of the other of said sides.

4,545,567

WINCH POWER TRANSMISSION

Thomas M. Telford, Gladstone, and James W. Haase, Milwaukie, both of Oreg., assignors to Warn Industries, Inc., Kent, Wash.

Filed Apr. 19, 1984, Ser. No. 602,160
Int. Cl.[4] B66D *1/22, 5/20*
U.S. Cl. 254—344 **10 Claims**



1. A winch comprising:

(a) a hollow cable winding drum rotatable about a longitudinal axis;

(b) a reversible motor means disposed longitudinally of a first end of said drum, said motor means including a first drive shaft means extending axially within said hollow drum;

(c) a power transmitting means operably connected to said drum and disposed longitudinally of an opposite, second end of said drum, said power transmitting means including a second drive shaft means extending axially within said hollow drum toward said first end of said drum;

(d) brake-clutch means disposed within said drum for drivingly interconnecting said first drive shaft means with said second drive shaft means, said brake-clutch means comprising:

(1) first brake means and second brake means for automatically frictionally engaging directly against the inside of said hollow drum when the direction of the torque load transmitted between said first drive shaft means and said second drive shaft means is in a first direction and automatically disengaging from the inside of said hollow drum when the direction of the torque load transmitted between said first drive shaft means and said second drive shaft means is in the opposite direction;

(2) a first overrunning clutch means disposed between said first drive shaft means and said first brake means permitting relative rotation between said first drive shaft means and said first brake means in a first direction but preventing relative rotation between said first drive shaft means and said first brake means in the opposite direction; and

(3) a second overrunning clutch means disposed between said second drive shaft means and said second brake means permitting relative rotation between said second drive shaft means and said second brake means in said first direction but preventing relative rotation between said second drive shaft means and said second brake means in said opposite direction;

(e) said first brake means comprising a first friction ring assembly, said first friction ring assembly including a frustoconically-shaped mandrel coupled to said first overrunning clutch means, a first correspondingly-shaped frustoconical expandable friction ring antirotationally coupled to said first mandrel, and means for antirotationally coupling said first friction ring to said first mandrel to prohibit relative rotation while allowing relative longitudinal movement between said first friction ring and said first mandrel;

(f) said second brake means comprising a second friction ring assembly, said second friction ring assembly including a second frustoconically-shaped mandrel coupled to said second overrunning clutch means, a second correspondingly-shaped frustoconical expandable friction ring antirotationally coupled to said second mandrel, and means for antirotationally coupling said second friction ring to said second mandrel to prohibit relative rotation while allowing relative longitudinal movement between said second friction ring and said second mandrel;

(g) brake actuator means automatically responsive to the direction of the torque load transmitted between said first drive shaft means and said second drive shaft means to expand said first and second friction rings against the inside diameter of said hollow drum when the direction of the torque load transmitted between said first drive shaft means and said second drive shaft means is in a first direction and to contract said first and second friction rings away from the inside diameter of said hollow drum when the direction of the torque load transmitted between said first drive shaft means and said second drive shaft means is in the opposite direction; and

(h) said brake actuator means comprising a first cam member antirotationally coupled with said first drive shaft means, said first cam member having an axially-facing cam surface, and a second cam member antirotationally coupled with said second drive shaft means, said second cam member having a corresponding axially-facing cam surface, said first cam member coacting with said second cam member as follows: 1) to move said first cam member axially toward said first-friction ring assembly and to move said second cam member axially toward said second friction ring assembly wnen th torque load being transmitted between said first and second drive shaft means is in said first direction to thereby urge said first and second friction rings against said first and second mandrels, respectively, to expand said friction rings against the inside diameter of said hollow drum; and 2) to move said first cam member axially away from said first friction ring

assembly and to move said second cam member axially away from said second friction ring assembly when the torque load being transmitted between said first and second drive shaft means is in the opposite direction to allow said first and second friction rings to shift axially away from said first and second mandrels to thereby enable said friction rings to contract away from the inside diameter of said hollow drum.

4,545,568

UNFIRED REFRACTORY STRUCTURAL MEMBER IN THE FORM OF A PLATE FOR USE AS AN EXPENDABLE LINING OF METALLURGICAL VESSELS

Hans Rothfuss; Günter Wieland, both of Wiesbaden, and Peter Schreiter, Hünstetten-Wallrabenstein, all of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,364

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306423

Int. Cl.[4] F27B *1/00*; C08K *3/22*

U.S. Cl. 266—280 **17 Claims**

1. An unfired refractory structural member in the form of a plate, suitable for use as an expendable lining for a metallurgical vessel, comprising:

20–100 parts by weight of magnesia sinter and 0–80 parts by weight of olivine, said magnesia sinter and olivine together having a grain size classification of 30–45% by weight of under 0.09 mm, and 55–70% by weight of 0.09–4 mm wherein 20–40% by weight of the total grains are over 1 mm,

a pore-forming material selected from the group consisting of (a) 1–2.5 parts by weight of cork having a grain size of up to 1 mm wherein at least 70% by weight of the grains are over 0.1 mm, and (b) 2–10 parts by weight of granulated ceramic fibers having a grain size of up to 4 mm,

2–4.5 parts by weight of a sodium phosphate, calculated as anhydrous phosphate, and

0.2–2.5 parts by weight of at least one additive selected from the group consisting of refractory clay and Cr_2O_3,

said structural member having an ignition loss of up to 0.6% by weight at 1000° C. after preliminary annealing at 400° C.

4,545,569

APPARATUS FOR POSITIONING, CONNECTING AND HANDLING COMPONENTS

Günter Schröder, Wetter, and Joachim Kiehne, Herborn, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,715

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1981, 3138483

Int. Cl.[4] B25J *11/00*; G21C *19/32*

U.S. Cl. 269—43 **13 Claims**

1. Apparatus for positioning, connecting and handling first and second elongated components comprising

a housing,

first clamping means fixed to said housing for holding said first component stationary,

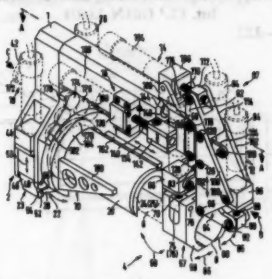
said first clamping means comprising a downwardly open longitudinally-disposed supporting sleeve for accommodating the first component and a clamping lever pivotable towards the supporting sleeve,

a locking device for locking the clamping lever in its pivoting position,

a power-actuatable locking jaw with a locking claw which engages the end of said clamping lever,

said locking jaw being formed with a cam slot for control of movement of said locking jaw and a guide pin fast with the housing engaging in said slot,

second clamping means for holding said second component, adjustably mounted on said housing for movement with respect to said clamping means, means mounted on said housing for moving said second clamping means to axially align said second component with said first component,



to shift it longitudinally toward and away from said first component, to tilt it with respect to the axis of said first component, and to lift it out of alignment with said first component but with its axis parallel to the axis of said first component.

4,545,570

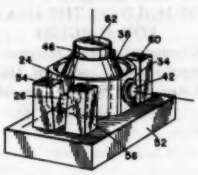
GIMBAL FIXTURE AND ASSEMBLY METHOD

Charles W. KaDell, Jr., Fullerton, Calif., assignor to General Dynamics/Pomona Division, Pomona, Calif.

Continuation of Ser. No. 526,698, Aug. 26, 1983, abandoned, which is a division of Ser. No. 383,373, May 28, 1982, Pat. No. 4,542,654. This application Dec. 24, 1984, Ser. No. 686,612

Int. Cl.[4] B23Q *1/00*

U.S. Cl. 269—52 **11 Claims**



1. A gimbal assembly fixture for aligning an axis of a gimbal relative to a support member; the combination comprisng:

a gimbal;

a gimbal support member;

a base member;

first engaging means on said base member for engaging and maintaining said gimbal support member in a predetermined position; and

second engaging means connected to said base member for engaging and maintaining said gimbal in a predetermined aligned position with respect to said gimbal support member.

7. A gimbal alignment fixture for aligning an axis of a gimbal relative to a support member; the combination during assembly of said gimbal with said support member comprising:

a gimbal;

a gimbal support member;

a base member;

first engaging means mounted on said base for engaging and maintaining said gimbal support member in a predetermined position; and

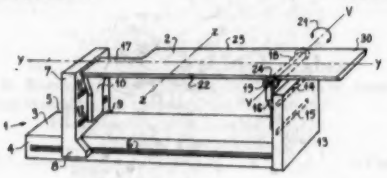
second engaging means connected to said base for engaging and maintaining said gimbal in a predetermined aligned position with respect to said gimbal support member.

4,545,571

LINEARLY DISPLACEABLE EXAMINATION TABLE

Edmond Chambron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 8, 1983, Ser. No. 502,165
Claims priority, application France, Jun. 11, 1982, 82 10241
Int. Cl.[4] G01N 23/04
U.S. Cl. 269—322 10 Claims



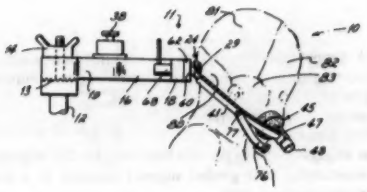
1. An x-ray examination table comprising: an elongate patient-bearing panel of a material which is a poor and uniform absorber of x-rays, said panel being longitudinally displaceable parallel to the longitudinal first axis, a first roller disposed to rotate about a roller axis which is transverse to said longitudinal first axis and fixed relative thereto, means for supporting said first roller, said patient-bearing panel resting on said roller and having an end overhanging beyond said roller by an amount which varies as a function of the longitudinal displacement of the panel; and means for supporting the other end of the panel so as to be displaceable parallel to said longitudinal first axis, said means for supporting said roller and said means for supporting the other end of the panel being displaceable parallel to a second axis which extends transverse to said longitudinal first axis.

4,545,572

APPARATUS FOR HOLDING THE HEAD OF A PATIENT FOR SURGERY

James L. Day, Cincinnati, Ohio, assignor to Ohio Medical Instrument Company, Inc., Cincinnati, Ohio

Filed Aug. 20, 1984, Ser. No. 642,634
Int. Cl.[4] A61G 13/00
U.S. Cl. 269—328 14 Claims



1. Apparatus for holding a patient's head for surgery on the top of the skull and orbits, comprising

a bracket,

rear support means mounted by said bracket for engaging the posterior of the patient's head,

a pair of arms,

means universally connecting each arm to said bracket at spaced positions thereon so that the arms are independently movable with respect to the bracket,

means for locking each universal connecting means to lock each arm in desired orientation with respect to said bracket,

each arm having a face pad adjustably mounted to it for engagement just below a cheekbone of said patient, said face pads facing toward said rear support means,

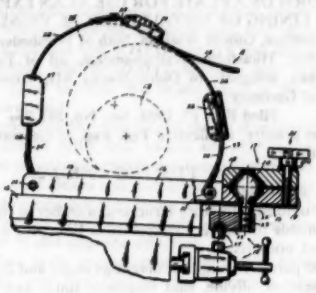
said face pads being positionable adjacent the cheekbones to hold the head securely against the rear support means.

4,545,573

SURGICAL LEG CLAMP

William J. Murphy, Saginaw, Mich., assignor to Saginaw Automation & Machine, Inc., Saginaw, Mich.

Filed Mar. 3, 1983, Ser. No. 471,755
Int. Cl.[4] A61G 13/00
U.S. Cl. 269—328 3 Claims



1. In a surgical leg clamp, the combination comprising:

an elongate main thigh-support frame having a left end, a right end and a substantially U-shaped cross-sectional configuration, said main thigh-support frame adapted for selective adjustable mounting upon an operating table;

a universal ball joint assembly integrally mounted within one end of said elongate main thigh-support frame, said universal ball joint assembly comprising a lower clamp block mounted within said U-shaped main support frame, said lower clamp block having an upper clamp block in operative engagement thereabove, said lower clamp block and said upper clamp block adapted to operably receive a universal ball joint therebetween;

operating table clamp means adapted to clampably mount said main thigh-support frame transversely on an operating table, said clamp means having said universal ball joint extending upwardly therefrom so as to be selectively in operative engagement within said main thigh-support frame between said lower clamp block and said upper clamp block positioned on said main thigh support frame so as to impart selective universal adjustment of said main support frame about its own longitudinal axis;

adjustment knob lock means provided in threadable engagement with said main thigh-support frame, said lower clamp block and said upper clamp block so as to clampably secure said main thigh-support frame in any selected position in relation to said ball joint positioned at one end of said main thigh-support frame;

a left guide arm freely pivotally connected to the left end of said main frame, said left guide arm adapted to extend upwardly from said main thigh-support frame along one side of a thigh positioned thereon;

a left retainer belt pivotally connected to the left end of said main thigh-support frame in operative engagement with said left guide arm, said left retainer belt adapted to extend upwardly along said left guide arm to a point therebeyond, said left retainer belt provided with a buckle-engaging tongue member, said tongue member selectively positioned approximately above a thigh positioned on said main thigh-support frame;

a right guide arm freely pivotally connected to the right end of said main thigh-support frame, said right guide arm adapted to extend upwardly from said main thigh-support frame in spaced-apart opposed registry with said left guide

arm so as to bracket therebetween a thigh positioned on said main frame;

a right retainer belt pivotally connected to the right end of said main thigh-support frame in operative engagement with said right guide arm, said right retainer belt adapted to extend upwardly along said right guide arm to a point therebeyond, said right retainer belt adjustably provided with a snap-release latch buckle assembly in aligned operative registry with said tongue member, said buckle assembly adapted to selectively engage said tongue member so as to connect said left retainer belt and said right retainer belt around a thigh positioned on said main frame, said right retainer belt adapted for selective incremental tightening so as to cause said left retainer belt and said right retainer belt to exert selective retentive pressure against a thigh positioned on said main frame, said snap-release buckle assembly adapted to permit selective disengagement and selective re-engagement of said left retainer belt and said right retainer belt while maintaining the original selected retentive pressure of said belts against the thigh upon re-engagement without need for re-adjustment of said surgical leg clamp assembly.

4,545,574

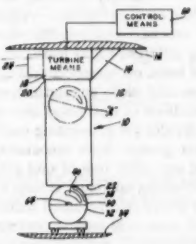
FLUID SUSPENDED PASSENGER CARRYING SPHERICAL BODY HAVING UNIVERSAL ATTITUDE CONTROL

John J. Sassak, 36855 Schoolcraft, Livonia, Mich. 48150

Continuation-in-part of Ser. No. 431,847, Sep. 30, 1982, Pat. No. 4,487,410. This application Jun. 27, 1983, Ser. No. 508,078

Int. Cl.⁴ A63J *5/12;* **G09B** *9/08*

U.S. Cl. 272—6 **12 Claims**



1. Apparatus comprising:

a base;

a spherical, passenger-holding body having closure means for receiving a passenger therein, the body being adapted to be mounted on the base in a lower position;

an upright tube having a lower opening and being mounted above the base for receiving the body as it is being raised from said lower position, to guide the body along a predetermined upward path of motion defined by the tube;

means for passing a fluid through the lower opening in the tube to raise the body above said lower position such that the body is supported solely by the fluid being received through the lower opening in the tube;

said fluid passing means being disposed above the lower opening of the tube and above the body at such times as the body is suspended in the tube;

external control means and internal control means, each having means adapted to be manipulated by the passenger to jointly control the universal attitude of the body when suspended in and by the fluid, the external control means biasing the body by reaction to the fluid and the internal control means biasing the body by imbalance.

4,545,575

APPARATUS FOR LEARNING TO SKI

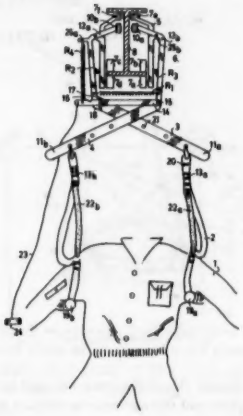
Roland Forjot, 117 avenue de Rimiez, 06100 Nice, France

Filed Mar. 23, 1983, Ser. No. 478,213

Claims priority, application France, Mar. 26, 1982, 82 05486

Int. Cl.⁴ A63B *7/00;* **B61B** *13/00*

U.S. Cl. 272—97 **4 Claims**



1. Apparatus for learning to ski, characterized by the fact that it comprises harness means (**2**) which permit supporting the skier (**1**) off balance just before his fall, said harness means being connected to a movable carriage (**6**) by means of retention straps (**13***a*, **13***b*), said carriage (**6**) being movable on a roller track which serves as a rail (**8**), in which the carriage (**6**) is mounted on rollers, and comprises brake means (**10***a*, **10***b*), and in which, in order to adjust the application and/or release of the brake means (**10***a*, **10***b*) as a function of the weight of the skier, cross bars (**3** and **4**) having several holes (**21**) are disposed along the longitudinal axis, and in which oppositely acting springs (R_1, $R_2$and R_3, R_4) and an actuating lever (**14**), having notches (**16**, **17**) which cooperate with a pawl (**18**), permit exact adjustment of the moment at which the retention straps (**13***a*, **13***b*) will act on the cross bars (**3** and **4**) so as to apply the brake means (**10***a*, **10***b*) on a vertical wall of said rail (**18**).

4,545,576

BASEBALL-STRIKE INDICATOR AND TRAJECTORY ANALYZER AND METHOD OF USING SAME

Thomas M. Harris, 1 Lake, Irvine, Calif. 92714

Continuation-in-part of Ser. No. 339,330, Jan. 15, 1982, abandoned. This application Aug. 13, 1983, Ser. No. 523,374

Int. Cl.⁴ A63B *71/02, 71/06*

U.S. Cl. 273—25 **22 Claims**

1. A baseball-strike-indicator-and-trajectory-analyzer apparatus adapted to be associated with a baseball diamond, including the pitcher's mound and home plate, comprising:

at least one pair of sensors positioned with respect to said baseball diamond, wherein each of said sensors has a field of vision that includes said pitcher's mound, a batter, and said home plate, whereby a ball moving between said pitcher's mound and said home plate is continuously within the field of view;

means connected to said sensors to record and store information, relating to all objects including said ball, received from said sensors;

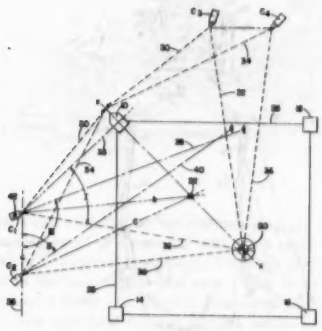
means connected to said recording and storing means to convert said information to a computer-compatible digital format;

computer means adapted to receive and analyze said information in digital form from said digital-converter means;

means to distiguish said ball from all other objects sensed by said sensors, so that said ball can be recognized and its trajectory defined in time and three-dimensional space;

means adapted to analyze the initial part of said ball's trajectory in order to compute a nominal trajectory;

means to determine said batter's dimensions when in his batting stance;



means to compute the strike zone for said batter;

graphics display and storage means adapted to receive computed information from said computer means to display graphically the movement of said ball in various selective pictorial arrangements; and

means for controlling said apparatus.

4,545,577

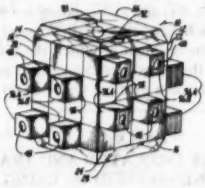
MAZE GAME DEVICE

Randy J. Randleman, P.O. Box 470, Gowrie, Iowa 50543

Filed Dec. 2, 1983, Ser. No. 557,609

Int. Cl.⁴ A63B *67/14*

U.S. Cl. 273—113 **22 Claims**



1. A maze gam device comprising:

a housing having top and bottom walls, four sidewalls, and a hollow interior;

transparent covers positioned over said top and bottom walls to contain at least one game object;

at least one aperture in each said top and bottom wall of such size to allow a said object to pass into said housing;

elongated button members extending perpendicular to and through each said sidewall into said housing;

each said button member extending across the interior of said housing to the opposite side and having cut-out tunnel portions along its length through which a said game object is passable;

each said button member being slidably depressible to change the position of said tunnel portions;

said button members of all side walls being interlaid with one another to occupy the entire space of said housing; and

so that by depressing one or more of said button members and tilting and orientating said housing, said game object may be maneuvered from outside of said top wall to outside of said bottom wall and back to outside of said top wall.

4,545,578

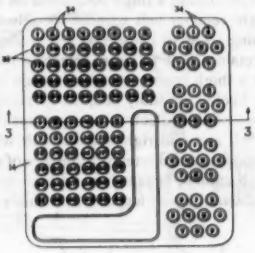
DEVICE FOR RANDOMLY SELECTING NUMBERS

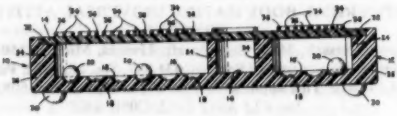
George A. Stagg, Jr., Wayne, N.J., assignor to Pentad Corp., Fairfield, N.J.

Filed Oct. 24, 1983, Ser. No. 544,751

Int. Cl.⁴ A63F *3/06, 7/04*

U.S. Cl. 273—144 B **10 Claims**





1. A device for randomly selecting numbers, comprising:

a base including an upper surface with a plurality of adjacent groups of recessed sections, the number of recessed sections being different for at least two of said groups;

a plurality of balls, each associated with a respective one of said groups and each engageable with any one of said recessed sections of said respective one of said groups;

at least one divider for preventing each ball associated with one of said groups from associating with the recessed sections of any other one of said groups;

a cover for covering said base, at least a portion of said cover positioned above said recessed section being transparent;

a plurality of numerical indicia corresponding to said numbers to be randomly selected, each positioned on one of said base or said cover in the proximity of a respective one of said recessed sections for identifying said respective one of said recessed sections; and

ball action enlivening means including a plurality of spaced supports secured to said base for imparting energy to said balls when said device is dropped onto a surface to cause the balls to move with greater randomness.

7. A device for randomly selecting numbers, comprising:

a base including an upper surface with a plurality of adjacent groups of recessed sections, the number of recessed sections being different for at least two of said groups, said upper surface having a first group with 40 recessed sections, a second group with 36 recessed sections, and third, fourth, fifth and sixth groups each with 10 recessed sections;

a plurality of 16 balls, each associated with a respective one of said groups and each engageable with any one of said recessed sections of said respective one of said groups, 6 of which are engageable within any of the recessed sections of the first group, 6 of which are engageable within any of the recessed sections of the second group, and the remaining four of which are engageable with any of the recessed sections of the third through sixth groups, respectively;

at least one divider for preventing each ball associated with

one of said groups from associating with the recessed sections of any other one of said groups;

a cover for covering said base, at least a portion of said cover positioned above said recessed section being transparent; and

a plurality of numerical indicia corresponding to said numbers to be randomly selected, each positioned on said cover in the proximity of a respective one of said recessed sections for identifying said respective one of said recessed sections, said plurality of numerical indicia including numbers 1 through 40 associated with the recessed sections of the first group, numbers 1 through 36 associated with the recessed section of the second group, and four sets of numbers 0 through 9, each set associated with the recessed sections of a respective one of the third through sixth group, respectively, each of said numerical indicia being formed as a raised transparent number on said cover and positioned above a respective one of said recessed sections.

4,545,579

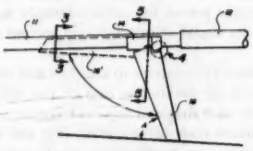
GOLF CLUB AND GOLF CLUB SUPPORT

Iona I. McCain, 40 S. Lassen St., Susanville, Calif. 96130

Continuation-in-part of Ser. No. 587,662, Mar. 8, 1984,. This application Dec. 6, 1984, Ser. No. 678,980

Int. Cl.[4] A63B *55/10*

U.S. Cl. 273—162 R **2 Claims**



1. A golf club support for use with a golf club having a shaft of varying diameter near its grip and a smaller diameter near its head, comprising:

a stationary section consisting of a substantially rigid semicylindrical sleeve having a concave inner surface with a diameter which is smaller than said larger diameter of said shaft, further having a section of its wall removed whereby said stationary section slips over said smaller diameter of said shaft and slides to said larger diameter of said shaft to a position where said shaft and said inner surface interfere with each other, thereby holding said stationary section tightly on said shaft, and including a detent, and

a support section consisting of a substantially conically-shaped hollow sleeve which is pivotally attached to said stationary section by pivot means whereby said support section pivots with respect to said stationary section and which has a substantially conically-shaped inner surface the smallest diameter of which is smaller than said larger diameter of said shaft, further having a section of its wall removed and having lips there attached so that said support section is held tightly against said shaft by said lips when it is positioned against said shaft, further having an edge which locks against said detent of said stationary section whereby said support section is locked into place with respect to said stationary section when it is pivoted into an open, supporting position.

4,545,580

WOOD-TYPE GOLF CLUB HEAD

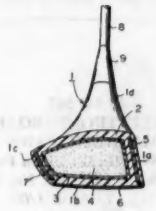
Osamu Tomita; Yoshihiko Murase, and Seiya Nishimura, all of Shizuoka, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 14, 1984, Ser. No. 580,109

Claims priority, application Japan, Feb. 15, 1983, 58-023194; Apr. 22, 1983, 58-071075

Int. Cl.[4] A63B *53/04*

U.S. Cl. 273—167 R **3 Claims**



1. An improved wood-type gold club head comprising

an outer shell made of fiber reinforced plastics,

an intermediate shell made of thermoplastic resin which is wholly embraced by and strongly bonded to said outer shell, and

a center core made of foam synthetic resin which is wholly embraced by and strongly bonded to said intermediate shell,

the elastic modulus of said thermoplastic resin used for said intermediate shell being smallar than that of said fiber reinforced plastics used for said outer shell and

the buckling strength of said thermoplastic resin used for said intermediate shell being larger than that of said foam synthetic resin used for said center core.

4,545,581

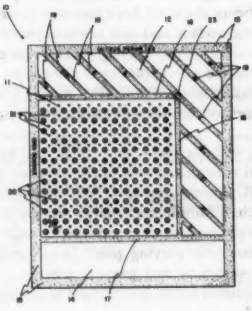
GOLF PRACTICE AID

Paul J. Williamson, Dunes Station, Box 7095, Myrtle Beach, S.C. 29577

Filed Oct. 28, 1983, Ser. No. 546,283

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—187 A **6 Claims**



1. An improved golf practice aid for indicating undesirable swaying movement which effects the golf swing comprising: a generally square mat having a generally square grid portion disposed in one corner thereof and an L-shaped alignment line portion adjacent to two-sides of said grid portion; ball location indicia associated with said grid portion and said alignment portion of said mat-like base for indicating the position of a golf ball; a grid pattern formed in said grid portion of said mat for

aligning the stance of the golfer in relation to said ball location indicia; and a plurality of generally parallel alignment lines formed in said L-shaped alignment line portion of said mat and disposed diagonally to said generally square grid portion for aligning the shoulders and hips of the golfer in relation to said ball location indicia whereby any sway or movement off proper position during practice swings will be visually indicated by apparent movement of said grid pattern formed in said grid portion of said mat.

4,545,582

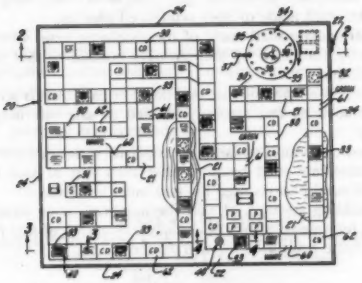
TRANSLUCENT ELECTRONIC BOARD GAME WITH MAGNETIC PAWN

Walter H. Andrews, 8920 Becker, Allen Park, Mich. 48101

Filed Feb. 25, 1983, Ser. No. 459,455

Int. Cl.⁴ A63F *3/00*

U.S. Cl. 273—238 **22 Claims**



1. A game apparatus, comprising:

a. a game board having a frame;

b. a horizontal translucent playing surface secured to said frame of the game board having an array of playing positions from start to finish thereon;

c. a horizontal nontranslucent bottom secured to said frame of the game board under said translucent playing surface;

d. a spacer being disposed between said horizontal translucent playing surface and said nontranslucent bottom;

e. a plurality of magnetic playing pieces, said playing pieces each having the same polarity at their tops;

f. a mover object said mover object having magnetic means for advancement of said playing pieces along said playing surface;

g. a plurality of light means secured to said horizontal nontranslucent bottom disposed under a plurality but less than all, of said playing positions, said light means having a reed switch, lightbulb and energy source in a closed circuit, said light means being activated as said mover object causes a magnetic playing piece to advance into certain playing positions on said game board;

h. a switch secured to the game board to activate the energy source and

i. a spinner having blue, red and green holes therein secured to the top surface of said game board, adjacent to the finish playing position;

j. whereby said magnetic playing pieces being advanced over the array of play positions by the magnetic repulsive forces emitted from said playing pieces and said mover object as said mover object is brought into close proximity thereto.

4,545,583

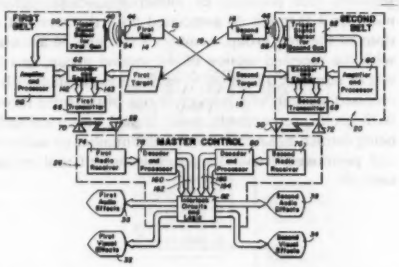
ELECTRONIC GUN AND TARGET APPARATUS AND METHOD

Bruce W. Pearman; Clark Pelton; Todd K. Roper, and Layne C. Tivis, all of Colorado Springs, Colo., assignors to Showdown Electronics, Inc., Colorado Springs, Colo.

Filed Dec. 23, 1982, Ser. No. 452,814

Int. Cl.⁴ F41G *3/26*

U.S. Cl. 273—311 **31 Claims**



1. A simulated fire and hit indicator apparatus, comprising:

first and second bullet signal sources operative to generate first and second bullet signals respectively;

a first trigger signal source operative to generate a first trigger-active signal at a first frequency;

a second trigger signal source operative to generate a second trigger-active signal at a second frequency different from said first frequency;

a first trigger means for simultaneously activating said first bullet signal source and said first trigger signal source;

a second trigger means for simultaneously activating said second bullet signal source and said second trigger signal source;

first output means responsive to said first and second trigger-active signals for producing first output indicative of the condition of said first and second triggers; and

processing means responsive to said first and second bullet signals for processing said bullet signals and producing hit output indicative of the earlier received one of said first and second bullet signals.

4,545,584

RACKET WITH ADJUSTABLE HANDLE

Günter Adam, Straubing, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Jul. 3, 1984, Ser. No. 627,513

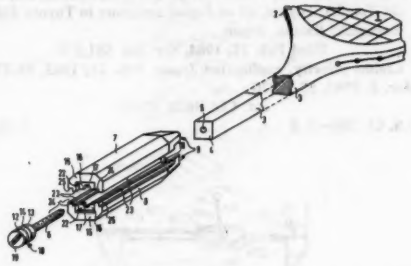
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324143

Int. Cl.⁴ A63B *49/08*

U.S. Cl. 273—73 J **29 Claims**

1. A racket having a frame surrounding a stringed hitting surface, said frame being provided with a hand-grip shaft, said hand grip shaft having one end attached to said frame and a free end, the hand-grip shaft being surrounded by a hand-grip formed of two half-shells which, at least in part, engage against the hand-grip shaft, at least the parts of the shells that engage the hand-grip shaft being formed of hard, substantially non-compressible material, wherein an elastic grip means in a form selected from the group consisting of an elastic winding strip, an elastic tube and several elastic tube sections surrounds the half-shells in a manner causing them to be pressed together so firmly that the hand-grip rests firmly on the hand-grip shaft, but is movable longitudinally along the hand-grip shaft, and wherein an adjusting means is provided for adjusting the position of the hand-grip relative to the hitting surface, said adjust-

ing means being secured to the hand-grip in a manner precluding axial and radial movement relative thereto and while at the



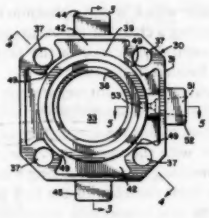
same time being interconnected with said free end of said hand grip shaft in a longitudinally adjustable manner.

4,545,585

MOLDED SEAL GLAND WITH GROOVE FOR COOLING FLUID

Frederic W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 6, 1984, Ser. No. 679,023
Int. Cl.[4] F16J *15/34, 15/54*
U.S. Cl. 277—22 **2 Claims**



1. A gland seal made of a plastic material having a main body,

a central annular wall creating a central cavity,

a central circular opening created by said annular wall adapted to receive a seal seat,

a top portion sealing the central cavity,

an inlet and outlet connection to the central cavity adapted to receive cooling fluid and pass cooling fluid through the cavity, and

an annular circumferential groove in said central annular passage adapted to surround a seal seat when seated in the central annular passage.

4,545,586

DAMPING SEAL FOR TURBOMACHINERY

George L. von Pragenau, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 489,902, Apr. 28, 1983. This application Jan. 18, 1985, Ser. No. 692,875
Int. Cl.[4] F16S *15/44;* **F01D** *11/08*
U.S. Cl. 277—53 **6 Claims**

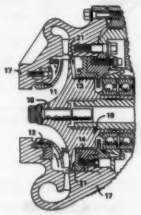
1. In a high speed turbomachinery, a journal bearing for increasing rotor speed significantly and damping rotor motion, comprising:

an elongated stator portion having a bore along its longitudinal axis;

an elongated rotor portion situated within said bore of said stator portion with a small gap therebetween;

a high pressure fluid volume on one side of said stator and rotor portions and a low pressure fluid volume on the other side of said stator and rotor portions so said small gap is filled with fluid leaking from said high pressure fluid side to low pressure fluid side and thereby acting as a journal support;

said rotor portion having a smooth rigid outer surface on the surface of said rotor portion facing the stator portion said



smooth rigid outer surface of said rotor portion having a typical roughness of 0.000032 inch;

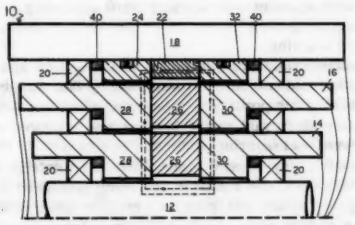
said stator portion having an outer surface provided with shallow patterned pockets facing said rotor portion for providing high roughness for all fluid flow directions so as to reduce leakage rate of fluid across said gap, and rotor whirl forces are reduced, said pockets having a pocket depth corresponding to 10 to 10,000 times the roughness depths of said smooth rigid outer surface of said rotor portion and having rigid side walls with a substantial thickness that prevent fatigue and break-up of the walls when rubbing contact with said rotor portion occurs.

4,545,587

COAXIAL, MULTIPLE-SHAFT FERROFLUID SEAL APPARATUS

Donald W. Higgins, Nashua, N.H., assignor to Ferrofluidics Corporation, Nashua, N.H.

Filed Nov. 20, 1984, Ser. No. 673,545
Int. Cl.[4] F16J *15/40, 15/16*
U.S. Cl. 277—80 **14 Claims**



1. A coaxial, multiple-shaft ferrofluid seal apparatus, which apparatus comprises:

(a) a housing;

(b) shaft elements within the housing and comprising a central shaft and a plurality of spaced apart, coaxial shafts about the central shaft element;

(c) the coaxial shaft element being characterized by a nonmagnetically permeable insulating shaft section and a first and second magnetically permeable section on either side of the nonmagnetically permeable section, the first and second sections of the coaxial shaft element having sur-

faces which extend into a close, noncontacting relationship with the surface of adjacent shaft elements and the central shaft to form radial gaps there between;

(d) a single permanent magnet means including first and second pole pieces, the pole pieces having a one end which extends into a close, noncontacting relationship with the surface of the first and second shaft sections respectively of the coaxial shaft elements to form radial gaps therewith; and

(e) ferrofluid in the radial gaps to form at least one ferrofluid O-ring seal between the respective surfaces of the shaft elements, the ferrofluid retained in the radial gaps by the magnetic flux from the single permanent magnet means, to provide for the independent sealed rotation of the shaft elements.

4,545,588

MECHANICAL FACE SEAL FOR SEALING SLURRY LIQUID

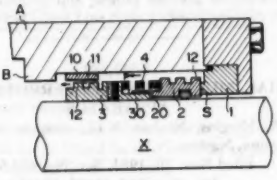
Yataro Nagai, and Kazuya Fukuoka, both of Tokyo, Japan, assignors to Tanken Seiko Corp., Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,241

Claims priority, application Japan, Jul. 8, 1983, 58-105397[U]; Nov. 4, 1983, 58-170125[U]; Nov. 28, 1983, 58-182130[U]

Int. Cl.⁴ F16J *15/38*

U.S. Cl. 277—93 SD **21 Claims**



1. A mechanical seal for providing a seal for a slurry liquid between a casing and a rotary shaft extending out of said casing, comprising:

a fixed seat ring;

a rotatable slide ring positioned in said casing and abutting against said seat ring to form a sealing face therebetween;

a helical spring positioned in said casing and surrounding said rotary shaft, said spring biassing said rotatable slide ring toward said seat ring;

a rotatable ring on said rotary shaft and rotatable with said rotary shaft, said rotatable ring being positioned in the casing for holding said spring in a predetermined position relative to said rotary shaft, said spring being interposed between said rotatable slide ring and said rotatable ring;

a small space being provided between said casing and said rotatable ring; and

said rotatable ring having a helical projection on the outer surface thereof and defining with said casing said small space, said helical projection of said rotatable ring being directed such that upon rotation of said rotary shaft said rotatable ring is rotated and produces a force in a direction away from said sealing face and toward the interior of said casing so as to cause said slurry liquid to move away from said sealing face and toward said interior of said casing.

4,545,589

VEHICLE BODY STRUCTURE FOR A LONGITUDINALLY EXTENDING FLOOR TANK AND A GEAR SHIFT MECHANISM

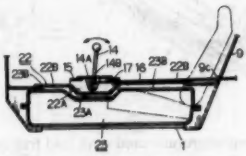
Hiroyuki Watanabe, Toyota; Kuniaki Osaka, Susono, and Yasushi Tanaka, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Feb. 21, 1984, Ser. No. 581,574

Claims priority, application Japan, Feb. 21, 1983, 58-27342; Mar. 3, 1983, 58-30870

Int. Cl.⁴ B62K *15/02*

U.S. Cl. 280—5 A **9 Claims**



1. A vehicle body structure, comprising:

a longitudinally extending floor panel;

a vertical extension of the longitudinally extending floor panel forming a floor tunnel longitudinally extending in the vehicle, the floor tunnel having a front portion, a rear portion and a central portion, the central portion being downwardly concave with respect to the front portion and rear portion;

a fuel tank located underneath the floor tunnel, the fuel tank having a shape which is complementary to the floor tunnel and including a chamber forwardly located in the tank, a chamber centrally located in the tank and a chamber rearwardly located in the tank;

a vapor separator means for separating vapor generated within the fuel tank from fuel stored in the fuel tank;

a first connecting means for connecting an inside portion of the fuel tank with the vapor separator, a first portion of the first connecting means extending from the vapor separator to the front chamber of the fuel tank and a second portion of the first connecting means extending from the vapor separator to the rear chamber of the fuel tank;

a canister for adsorbing fuel vapor through the vapor separator;

a second connecting means for connecting the vapor separator with the canister; and

a gear shift lever for changing a transmission ratio, the gear shift lever being located in the downwardly concave central portion of the floor tunnel and having an outermost end and an innermost end.

4,545,590

COMPOSITE WOODEN HORSE CART WITH FORWARD AND BACKWARD CONTROLS

Chin-Chung Wang, 29, Alley 2, Lane 47, Shiang Shih Rd., Sec. 2, Pan Chiao Taipei Hsien, 220, Taiwan

Filed Feb. 10, 1983, Ser. No. 465,662

Int. Cl.⁴ A63G *15/00*

U.S. Cl. 280—1.175 **6 Claims**

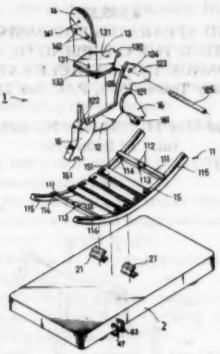
1. A rocking horse cart toy which comprises:

(a) a simulated horse with means for a child to sit astride the horse,

(b) a wheeled cart with means for mounting the horse thereon and to provide a controlled rocking movement,

(c) a forward pawl and ratchet mechanism and a reverse pawl and ratchet mechanism mounted on an axle of said cart, each mechanism effective in its direction for a selected distance to

effect conversion of impulses of the rocking movement of the horse into a one way movement of the cart wheels, and



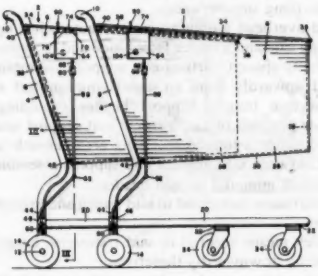
(d) a reversal means for transferring axle control from one pawl and ratchet mechanism to the other at the conclusion of the selected distance.

4,545,591

SHOPPING CART

Frances R. Balha, 932 Chevy Chase Dr., Sarasota, Fla. 33580

Filed Mar. 2, 1984, Ser. No. 585,381
Int. Cl.[3] B62B *5/04*
U.S. Cl. 280—33.99 C **8 Claims**



1. A shopping cart comprising:

a. a frame nestable forwardly into the frame of another like cart,

b. ground-engaging wheels carried rotatably by and supporting said frame,

c. a basket open at its rearward end mounted on said frame and being forwardly tapered whereby to be nestable forwardly into the basket of another like cart,

d. a rear basket wall operable when closed to close the rearward end of said basket, but being pivotably mounted on a horizontal transverse axis at its upper edge, whereby to be deflectable upwardly and forwardly by the forward end of the basket of a like cart to permit nesting of said baskets,

e. a mechanical locking device operable when engaged to lock said rear basket wall closed, and to lock at least certain of said wheels against rotation, and

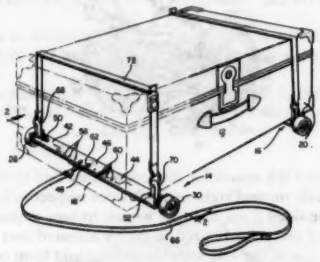
f. manual operating means for selectively engaging and disengaging said locking device.

4,545,592

ADJUSTABLE WIDTH LUGGAGE CARRIER APPARATUS

Boris Taskovic, 10226 Ave. "L", Chicago, Ill. 60617

Filed Nov. 2, 1983, Ser. No. 547,979
Int. Cl.[4] B62B *3/02*
U.S. Cl. 280—35 **7 Claims**



1. An adjustable width luggage carrier apparatus for supporting and towably carrying luggage of various different widths, said apparatus comprising:

front and rear assemblies disposed respectively near the front and rear of the luggage to be carried, each said front and rear assembly having a longitudinal dimension which is disposed transversely across the bottom surface of the luggage for supporting and carrying the luggage, each said front and rear assembly having

(i) a pair of wheel axles;

(ii) a pair of wheels each of which wheels is rotationally borne upon one of said pair of axles;

(iii) an axle col telescopingly engaging an interconnecting said wheel axles to permit the separating distance between said pair of wheels to be adjusted to accommodate luggage of various different widths;

(iv) luggage securement means for securing the luggage to the luggage carrier attached to each of said front and rear assemblies;

at least said front assembly further including a pair of yoke members having a combined length, which yoke members are disposed in overlapped relationship at one end thereof, and each of which yoke members includes a slot at the distal end thereof and a plurality of apertures disposed in space relationship at the proximal end thereof, whereby one of the apertures of each of said yoke members may be selected for overlapping to adjust the overall combined length of the yoke members according to the width of the luggage to be carried;

each of the wheel axles of said front member including slot holding means for engaging the slot of said yoke members to hold the distal ends of the wheel axles at a selected distance apart;

pin means for engaging and securing the overlapped apertures of said yoke members; and

towing means for attachment to said yoke means near the overlapped apertures thereof for towing the luggage carrier.

4,545,593

ENHANCED MOBILITY WHEELCHAIR

Jeffrey R. Farnam, 3035 Humboldt Ave. S., Minneapolis, Minn. 55408

Filed Nov. 4, 1983, Ser. No. 549,247
Int. Cl.[4] B62M *1/14*
U.S. Cl. 280—242 WC **8 Claims**

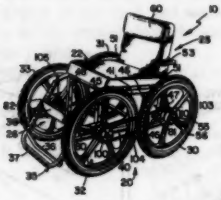
1. A user-propelled wheelchair comprising:

a seat supported on a frame;

right and left rear wheels rotatably mounted on opposite sides of said frame near the rear thereof;

right and left front wheels rotatably mounted on opposite sides of said frame near the front thereof;

said wheels being mounted to said frame by means of adjustable brackets whereby the longitudinal mounting position of the wheels may be slideably adjusted;



right and left means for interconnecting said front and rear wheels on said right and left sides respectively, to cause same-sided front and rear wheels to turn in unison; and

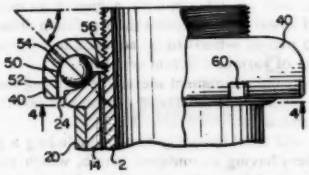
each of said wheels sized to enable a seated user to propel and maneuver said wheelchair from said front or said rear wheels.

4,545,594

BALL RACE FOR BICYCLE HEADSET

Maximino R. Cabeza, Calle Central 709, Miramar, Santurce, P.R. 00907

Filed Jul. 15, 1983, Ser. No. 514,019
Int. Cl.[4] B62K *21/18*
U.S. Cl. 280—279 **1 Claim**



1. A circular ball bearing race for a bicycle headset, comprising upper and lower race members having, respectively, downwardly and upwardly facing annular arcuate surfaces defining a race for receiving a plurality of balls, the configurations of the balls engaging surfaces of the upper and lower race members being such that the centers of the areas of tangency of the surfaces with the balls are in a line which makes an acute angle with the horizontal,

(a) the upper race member comprising:

i. an outer depending annular skirt the lower edge of which is below the lower edge of the arcuate surface of the lower race member,

ii. a substantially horizontal part extending inwardly from the upper part of the skirt and having a horizontal, flat upper surface,

iii. a vertical screw-threaded surface adapted to be connected to the fork stem of the bicycle and extending vertically downwardly from the inner end of said flat upper surface,

iv. an inner surface which extends from its contact with the balls toward the fork tube and downwardly in a curve which follows the configuration of the upper surfaces of the balls to a point between the centers of the balls and the lower end of the threaded surface where it forms an edge with a short horizontal surface extending to the lower end of the threaded surface, and

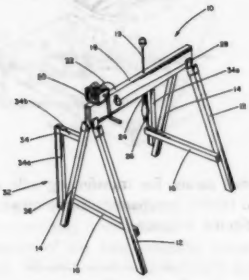
v. a plurality of spaced slots formed in the outer surface of the skirt for engagement by a tool to permit adjustment and retention of the position of the upper race member on the threaded surface.

4,545,595

METHOD AND APPARATUS FOR ASSISTING IN AND FACILITATING THE COUPLING OF A TRAILER TONGUE TO A VEHICLE LATCH

Joe B. Gray, Coby Trailer Park, P.O. Box 219, Butner, N.C. 27509

Filed May 11, 1984, Ser. No. 609,428
Int. Cl.[4] B60S *9/04*
U.S. Cl. 280—477 **9 Claims**



1. An apparatus for assisting in and facilitating the hitching of a trailer to a vehicle wherein the trailer includes a tongue having a hitching end and wherein the vehicle includes a hitch extending rearwardly from a rear bumper, said apparatus comprising:

A. an overhead tongue support structure, independent of said trailer and vehicle, straddling said tongue for engaging and supporting said tongue a selected height above an underlying support area;

B. said overhead tongue support structure having a vehicle facing side and a trailer facing side and including a pair of laterally spaced vertical end support assemblies that extend upwardly from an underlying support area and a transverse tongue support header extending between upper portions of said vertical end support assemblies so as to define a tongue receiving area beneath said header and between said vertical end support assemblies;

C. a winch mounted on said header;

D. cable means connected to said winch and extending therefrom;

E. pulley means secured to said transverse header and depending downwardly therefrom;

F. said cable extending from said winch being trained around said pulley means and including attaching means formed thereon for attaching to said trailer tongue such that by winding said winch said tongue can be pulled to a selected height under said header and supported thereat such that said vehicle hitch can be conveniently positioned thereunder for easy coupling;

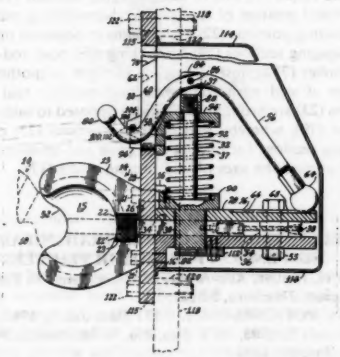
G. bumper engaging means mounted to the vehicle facing side of said overhead tongue support structure for engaging and sensing the presence of the rear bumper of the vehicle as the same is backed into a hitching relationship with said tongue so as to appraise the operator of the relative position of the vehicle hitch with respect to the hitching end of said tongue; and

H. an aligning indicator secured to said header and extending upwardly therefrom for assisting the vehicle operator in aligning the vehicle and hitch thereof with said trailer tongue as the vehicle is backed to a position for coupling a trailer tongue to said hitch.

7. A method of supporting a trailer tongue in an elevated position and for facilitating the hitching of the trailer tongue to a vehicle hitch comprising the steps of:

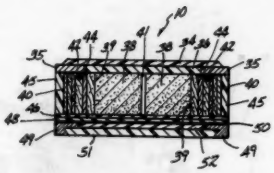
A. straddling the trailer tongue with an overhead support structure;
B. attaching a pulley to said overhead support structure and extending the pulley downwardly from said overhead support structure;
C. pulling a cable segment from a winch;
D. threading that cable segment through said pulley;
E. directing the cable segment downwardly from the pulley to the underlying trailer tongue;
F. attaching the cable segment below the pulley to the trailer tongue;
G. winding the winch so as to pull and elevate the trailer tongue towards said pulley;
H. locking the winch once the trailer tongue has been raised and elevated to a selected height and supporting the trailer tongue at that selected height;
I. moving a vehicle hitch to an appropriate coupling position below the trailer tongue;
J. lowering the trailer tongue onto said vehicle hitch by releasing said winch and allowing the cable to move downwardly from the pulley;
K. coupling the trailer tongue to the vehicle hitch; and
L. disconnecting the cable segment from the trailer tongue.

4,545,596
TRAILER COUPLER
Floyd L. Luke, 139 E. Main St., and Mark C. Luke, Rte. 1, both of Michigamme, Mich. 49861
Filed May 16, 1983, Ser. No. 495,134
Int. Cl.[4] B62D 1/06
U.S. Cl. 280—509 **7 Claims**



1. A vehicle mounted coupling device for selectively attaching and releasing one member to and from a spherical member comprising;
a housing affixed to a vehicle;
a first coupling element pivotally mounted to such housing;
a second coupling element pivotally mounted to such housing;
a pair of opposed cup members, mounted to such coupling elements, such coupling elements being pivotal from an open position to a closed position in which the cup members encompass such spherical member;
a deadbolt mounted to the housing;
such coupling elements having deadbolt receiving apertures formed there-through operable to receive such deadbolt when the coupling elements are pivoted to a position in which the cups are closed;
means for urging the deadbolt into such deadbolt receiving apertures;
means for raising such deadbolt to release the cups;
opposed strikers extending outwardly from the rear mating surfaces of the opposed cups into the open space between the cups, such strikers being adapted to receive the inserted spherical member;
such cups having striker nesting recesses formed in the opposed cups, adapted to receive and enclose such strikers when the cups are closed.

4,545,597
REINFORCING RIBS IN A SNOW SKI WITH A WOOD/FOAM CORE
Franklin D. Meatto, Cromwell, and Edward D. Pilpel, Manchester, both of Conn., assignors to Olin Corporation, Cheshire, Conn.
Continuation-in-part of Ser. No. 318,190, Nov. 4, 1981, Pat. No. 4,455,037. This application Jun. 18, 1984, Ser. No. 621,758
Int. Cl.[4] A63C 5/12
U.S. Cl. 280—610 **15 Claims**

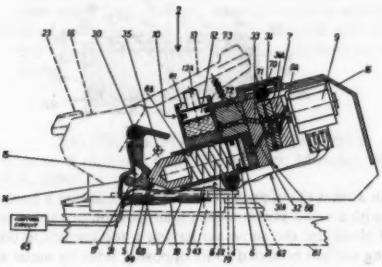


1. In a snow ski of predetermined length having a composite core with a wood portion and a foam portion of known modulus of elasticity, the snow ski having a top surface, a bottom running surface bounded to its opposing sides by metal edges and two opposing sides positioned generally perpendicularly to the top and bottom surfaces and intermediate thereof, the improvement comprising in combination:
a the composite core having the foam portion interiorly of the wood portion, the wood portion having a longitudinally extending slot in which is embedded fiber reinforcing means; and
b. at least two reinforcing rib members positioned generally perpendicularly and connected to the top and bottom surfaces interiorly of the two opposing sides adjacent the wood portion of the composite core, the reinforcing rib members being formed from aluminum with a relatively high modulus of elasticity in comparison to the composite core giving a high ratio of the modulus of elasticity for the combined material of the reinforcing rib members and the composite core to the density for the combined material of the reinforcing rib members and the composite core so that an increased rate of return and a controllably designed natural frequency is imparted to the ski.

4,545,598
SAFETY SKI BINDING
Engelbert Spitaler, Wr. Neudorf; Gerhard Oberleitner, Vienna; Josef Svoboda, Schwechat; Theodor Nitschko, and Wilfried Riss, both of Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland
Filed Oct. 27, 1981, Ser. No. 315,671
Claims priority, application Austria, Oct. 31, 1980, 5376/80
Int. Cl.[4] A63C 9/084
U.S. Cl. 280—612 **9 Claims**

1. A ski binding adapted to be mounted on a ski for releasably holding a sole of a ski boot on the ski, including a ski binding jaw which comprises: base means adapted to be mounted on the ski; a sole holder adapted to engage the sole of the ski boot and supported on said base means for movement between a downhill skiing position and a release position; means defining a locking surface on one of said base means and said sole holder; a locking member supported on the other of said base means and said sole holder for movement toward and away from said locking surface parallel to a first direction, said

locking member sliding along said locking surface as said sole holder moves away from said downhill skiing position toward said release position; first cylinder-piston means Provided on said other of said base means and said sole holder and including means defining a first chamber and a first piston sealingly supported in said first chamber for reciprocal movement approximately parallel to said first direction; means provided between and operatively coupling said first piston and said locking member, including resiliently compressible means for yieldably resisting movement of said first piston toward said locking member; second cylinder-piston means which includes means defining a second chamber and a second piston sealingly supported in said second chamber for reciprocal movement therein; first and second passageway means which each provide fluid communication between said second chamber on one side of said second piston and said first chamber on a side of said first piston remote from said resiliently compressible means; check valve means provided in said first passageway



means for permitting fluid flow through said first passageway means from said second chamber to said first chamber and for obstructing fluid flow therethrough from said first chamber to said second chamber; electrically actuable valve means provided in said second passageway means for permitting and obstructing fluid flow therethrough when respectively energized and de-energized; means for applying a force to said second piston in a second direction so as to urge fluid in said second chamber to flow through said first and second passageway means; sensor means for producing electrical signals in response to forces exerted on a ski boot releasably held by said binding; calculator means responsive to said sensor means and operatively coupled to said electrically actuable valve means for selectively energizing said electrically actuable valve means in response to said signals from said sensor means; and manually actuable means for selectively opening said check valve means so as to permit fluid flow through said first passageway means from said first chamber to said second chamber.

4,545,599

CONNECTING STRUCTURE BETWEEN PUSH RODS AND PUSH ROD-CONNECTING ROD IN BABY CARRIAGE

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Apr. 19, 1983, Ser. No. 486,344
Claims priority, application Japan, May 19, 1982, 57-85493
Int. Cl.[4] B62B *7/06*
U.S. Cl. 280—642 **9 Claims**

1. A connecting structure for a baby carriage disposed between two push rods (1) for maintaining said push rods at a predetermined spacing when the baby carriage is opened and for narrowing said spacing when the baby carriage is closed, comprising a push rod-connecting member (7) connected between said push rods (1), said push rod-connecting member being foldable at least in one place in its central portion whereby a folding and unfolding action changes said spacing between said push rods (1), a pair of brackets (16) extending inwardly from said push rods (1), a pair of turning shafts (17) provided on said brackets (16), a pair of sockets (18) held by said turning shafts (17) for tilting said sockets relative to said brackets (16), said push rod-connecting member (7) having ends received in said sockets for permitting a rotating movement of said push rod-connecting member around the longitudinal axis of said push rod-connecting member (7), a pair of engaging sections (19) rigidly secured to said push rods (1) at positions opposed to the lateral surfaces of the ends of said push rod-connecting member (7), and a pair of lock control sections (20) secured to the ends of said push rod-connecting member (7) for rotation with said push rod-connecting member

(7), each of said lock control sections having an abutting portion (22) of relatively large radius and a clearing portion (23) of relatively small radius, said turning shafts (17) being so spaced from the respective one of said engaging sections (19), that in one rotated position of said push rod-connecting member (7) said abutting portions (22) are brought to positions opposed to said engaging sections (19) for locking said push rod-connecting member (7) against folding, and so that in another rotated position of said push rod-connecting member said clearing portions (23) are brought to positions opposed to said engaging sections (19), whereby said clearing portions (23) clear said engaging sections for folding said push rod-connecting member (7) around the axes of said turning shafts (17).

4,545,600

ELEVATED ROLL CENTER TRAILING ARM SUSPENSION FOR MOTOR VEHICLES

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01021, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO85/00326, PCT Pub. Date Jan. 31, 1985
PCT Filed Jul. 5, 1983, Ser. No. 525,057
Int. Cl.[4] B60G *11/58*
U.S. Cl. 280—668 **3 Claims**

2. An independent wheel suspension system for the steerable wheels of a vehicle of the type wherein a resiliently telescoping

strut assembly is interposed between the wheel and a portion of the vehicle body at each wheel, and a trailing arm member is pivotally mounted to the wheel and strut assembly and is pivotally mounted to the vehicle chassis forwardly of the wheel, characterized in that the trailing arm member is mounted to the vehicle chassis for pivotal movement about an axis canted upwardly and inwardly with respect to the longitudinal vertical plane of symmetry of the vehicle and extending forwardly and below the pivotal connection of the trailing arm with the vehicle wheel and strut assembly, and wherein the trailing arm instantaneous pivotal axis is defined by a pair of transversely spaced axially aligned pivotal connecting members operatively disposed between the vehicle chassis and the trailing arm member and at least one of the connecting members is secured to resilient mounting means.

4,545,601

STAMPED STRUT AND SPINDLE SUPPORT

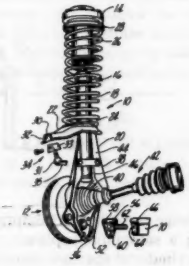
George H. Muller, Ann Arbor, and Buddy K. Chance, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01020, § 371 Date Jul. 5, 1983, § 102(e) Date Jul. 5, 1983, PCT Pub. No. WO85/00325, PCT Pub. Date Jan. 31, 1985

PCT Filed Jul. 5, 1983, Ser. No. 526,075

Int. Cl.⁴ B60G *11/58*

U.S. Cl. 280—668 **7 Claims**



1. An independent wheel suspension system for the steerable wheels of a vehicle of the type wherein a resiliently telescoping strut assembly is interposed between the wheel and a portion of the vehicle body at each wheel and a trailing arm member is pivotally mounted to the wheel and strut assembly and is pivotally mounted to the vehicle chassis forwardly of the wheel, characterized in that the strut assembly includes a telescoping portion and a support portion comprising a strut support stamping fixedly secured to the telescoping portion and a spindle support stamping attached to the strut support stamping to form a unitary structure, the strut support stamping having portions integrally formed therewith for effecting pivotal connection with the trailing arm member.

4,545,602

INDEPENDENT REAR SUSPENSION SYSTEM FOR AUTOMOTIVE VEHICLE

Yasuji Shibahata, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Aug. 10, 1984, Ser. No. 639,487

Claims priority, application Japan, Oct. 27, 1983, 58-201284

Int. Cl.⁴ B60G *3/00*

U.S. Cl. 280—701 **13 Claims**

1. An independent suspension system for a vehicle having a vehicle body with a vehicle longitudinal axis and a road wheel, comprising:

a wheel support rotatably carrying the road wheel;

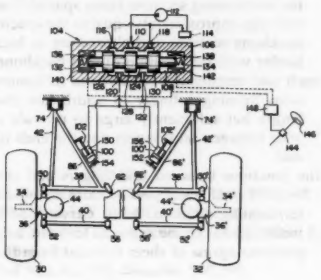
a first lateral link having one end pivotably mounted via an elastic bush on said wheel support about a first predetermined pivot axis which lies substantially in parallel to the vehicle longitudinal axis;

a second lateral link having one end pivotably mounted via an elastic bush on said wheel support about said first predetermined pivot axis; said second lateral link extending in parallel to said first lateral link,

said first lateral link having an opposite end pivotably mounted via an elastic bush on the vehicle body about a second predetermined pivot axis;

said second lateral link having an opposite end pivotably mounted via an elastic bush on the vehicle body about a third predetermined pivot axis which lies substantially parallel to the vehicle longitudinal axis;

a radius rod having one end movable with said wheel support and an opposite end pivotably mounted on the vehicle body about a fourth predetermined pivot axis, said radius rod extending generlly along the vehicle longitudinal axis;



said second predetermined pivot axis being so inclined from the vehicle longitudinal axis as to provide an arrangement whereby when a force is applied to that portion of said first lateral link which is disposed near said opposite end of said first link in a direction along said second predetermined pivot axis, said first link moves transversely with respect to the vehicle longitudinal axis further than said second lateral link does, causing said first predetermined pivot axis to tilt and varying a toe angle of the road wheel; and

means for applying force to said that portion of said first lateral link in at least said one direction.

4,545,603

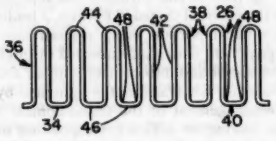
RING BINDING WITH BROADENED RINGS

Martin E. Henes, Denville, and George Roth, New Milford, both of N.J., assignors to Spiral Binding Company, Inc., Clifton, N.J.

Filed Jan. 9, 1984, Ser. No. 569,036

Int. Cl.⁴ B42B *5/10*

U.S. Cl. 281—21 A **3 Claims**



1. A wire ring binder for binding sheet material perforated with identical apertures which are elongated parallel to an edge of the material to an extent wherein the spacing between successive ones of the apertures is constant and approximately

equal to the length of the apertures, said binder being formed of a continuous wire segment and comprising:

a backbone formed of a sequence of spaced apart aligned sections of said wire;

a first set of finger sections of said wire extending from the front ends of respective ones of said backbone sections;

a second set of finger sections of said wire extending from the back ends of respective ones of said backbone sections, the finger sections of said first set and of said second set being substantially perpendicular to their respective backbone sections, each of said finger sections of said first and said second sets being curved in a plane normal to said backbone for entry through one of said apertures;

terminating sections of said wire, each of said terminating sections connecting an outer end of a finger section of said second set on one backbone section with the end of a finger section of said first set on the next backbone section, the terminating sections being spaced from each other by spacings approximately equal to the spacings between said backbone sections and alternating in location along said binder with the location of said backbone sections;

each said terminating section and its connected finger sections forming a finger of width less than said aperture length but sufficiently large to provide negligigle clearance between said fingers and the ends of said apertures; and

the junctions between said fingers and the corresponding ends of said backbone sections being curved, and said terminating sections being curved for partial overlaps with said backbone sections to form an interlock which prevents egress of sheet material from the binder.

4,545,604

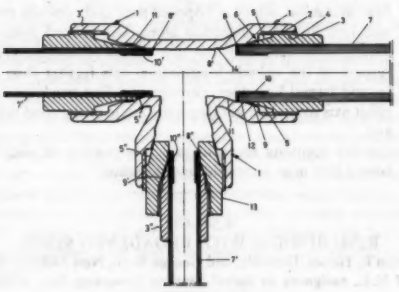
CLAMP CONNECTOR FOR PIPES

Thor F. Braathen, 3358 N. Eggedal, Nedre, Norway

Filed Aug. 16, 1983, Ser. No. 523,568

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—12 **3 Claims**



1. In a clamp connector for pipes, wherein a housing has at least one end with internal threads to be connected to a pipe, a base, a frusto-conical portion situated internally of the threaded portion adapted for engagement with a clamping nut having external threads and a frusto-conical portion extending axially from the external threaded portion, a leading end of the latter frusto-conical portion being pressed into sealing and retaining engagement with a pipe inserted through the nut into the clamp connector and into contact with an abutment at the base of the housing when said nut is tightened by the threads through interengagement of the frusto-conical portions, the clamping nut having an orifice corresponding to the outside diameter of the pipe, and the angle of taper of the frusto-conical portion of the clamping nut being smaller than the angle of taper of the frusto-conical portion on the connector housing, wherein the diameter of the clamping nut orifice is the same as the minimum diameter of the opening defined by the frusto-conical portion, the improvement wherein each connector end further comprises a second conical portion in said housing axially internally of said first mentioned frusto-conical portion, a second abutment axially internally of said second frusto-conical portion, the maximum diameter of said second frusto-conical portion being substantially the same as the minimum diameter of said first frusto-conical portion, a cylindrical portion in said housing defining an opening between said frusto-conical portions having a diameter substantially the same as said minimum diameter of said first frusto-conical portion, a second clamping nut interchangeable with said first clamping nut, an orifice in said second clamping nut having a diameter corresponding to the outer diameter of a second pipe smaller than the first mentioned pipe, the minimum diameter of said second frusto-conical portion being substantially the same as the diameter of the orifice of said second clamping nut, so that said connectors can be used for pipes having two different outside diameters.

4,545,605

WELDED TUBE AND FLANGE, E.G., FOR EXHAUST MANIFOLD

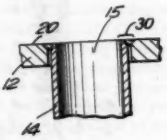
James E. Gerber, Walbridge; Robert J. Kovacs, Oregon, and Willy Herrmann, Toledo, all of Ohio, assignors to APX Group, Inc., Toledo, Ohio

Division of Ser. No. 417,210, Sep. 13, 1982, Pat. No. 4,500,030.

This application Feb. 16, 1984, Ser. No. 580,833

Int. Cl.⁴ F16L *41/08, 41/02*

U.S. Cl. 285—189 **1 Claim**



1. A tube and flange combination comprising:

a flange having a substantially planar top surface and a substantially cylindrical aperture therethrough;

a substantially cylindrical tube extending through the bottom surface of the flange to the top surface of the flange, the end of the tube being substantially disposed in the plane of the top surface of the flange, the radius of the tube being between approximately 0.01 inch and 0.10 inch less than the radius of the aperture through the flange defining a gap therebetween; and

an interface portion connecting the tube to the flange at the aperture of the flange, said interface portion comprising (i) a chamfer in the flange at the intersection of the top surface and the aperture, and (ii) weld material disposed between the tube and the flange at the chamfer and at least part of said gap, said weld material functioning to securely fasten the tube to the flange and having a top weld surface substantially disposed in the plane of the top surface of the flange.

4,545,606

DOOR LATCH ASSEMBLY

Richard J. Vodra, 3155 Highway 98E, Destin, Fla. 32541

Filed Jan. 31, 1983, Ser. No. 462,609

Int. Cl.⁴ E05B *65/10;* **E05C** *3/16*

U.S. Cl. 292—92 **27 Claims**

1. In the combination with a door hinged at one edge within a door jamb with a latch assembly mounted upon a closing edge and strike on said jamb registerable with said latch assembly, said latch assembly comprising a housing secured to said door;

a latch intermediate its ends pivotally mounted upon said housing upon a first axis and at one end projecting from

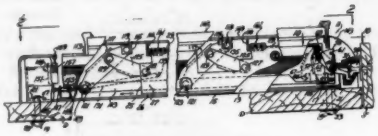
said housing and having an outwardly opening lock chamber, there being a lock aperture within the other end of said latch;

said latch having a locking position registerable with and receiving said strike, and normally biased toward an unlocked position disengaged from said strike;

said strike on closing said door engaging and rotating said latch to its locking position;

a pivot member adjacent one end pivotally mounted upon said housing upon a second axis parallel to said first axis;

means biasing said pivot member toward a locking position, said pivot member being retractable to an unlocked position;



a lock pin upon said pivot member parallel to said second axis and adapted for interlocking retaining registry with said lock aperture when said latch is in its locking position;

a spring biased reciprocal latch bar within and mounted upon said housing, adjacent one end having an actuator engageable with said pivot member;

a movable means upon said housing connected to said latch bar for retracting said actuator for moving said pivot member to its unlocked position disengaging said latch;

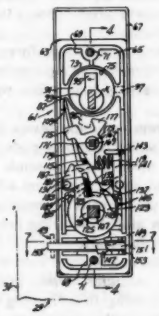
said latch being free to move to its unlocked position on opening the door relative to said strike.

4,545,607

DOOR CONSTRUCTION

Leon Yulkowski, 40 W. Howard, Pontiac, Mich. 48058

Filed Sep. 23, 1982, Ser. No. 422,252
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **17 Claims**



1. In a door hinged to a frame having a locking channel pivotally mounted upon a vertical axis upon its closing edge aligned with the door and interlocked with an elongated engaging element upon the frame, said channel being sufficiently movable relative to the door that it disengages said engaging element so that the door may open, and a blocking means movably mounted upon the door in one position retaining the channel in a locked position when the door is closed and movable to a release position;

the improvement comprising;

a lever rotatably mounted upon said door;

and a linkage means movably mounted upon the door interconnecting said lever with said blocking means;

said linkage means including an actuator movably mounted at one end within the door and at its other end operatively engaging said blocking means;

said linkage means further including a clutch housing movably mounted upon the door and having a depending actuating surface;

said actuator having a cam surface therein operatively receiving said actuating surface whereby movement of said clutch housing moves said actuator, said actuator on pivotal movement moving said blocking means to its release position, so that said channel moves to disengage said engaging element;

said linkage means further including spaced opposed inner and outer hubs upon opposite sides of said clutch housing movably mounted upon said door and supporting said clutch housing;

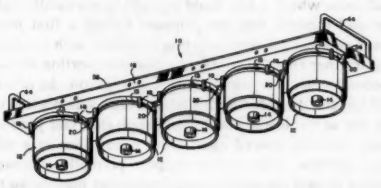
said lever being projected into one of said hubs.

4,545,608

APPARATUS FOR FACILITATING THE MOVEMENT OF A PLURALITY OF CONTAINERS

John R. Dodd, Warminster, Pa., assignor to Henry Mann, Inc., Huntington Valley, Pa.

Filed Sep. 8, 1983, Ser. No. 530,299
Int. Cl.[4] B66C *1/44*
U.S. Cl. 294—87.1 **1 Claim**



1. An apparatus for facilitating the movement of a plurality of open-topped containers and for depositing the containers in a predetermined aligned spaced relationship comprising:

an elongated generally rigid base member generally rectangular in cross section, the base member being at least slightly wider than the container width and being at least slightly longer than the combined lengths of the containers;

a plurality of gripping elements pivotally mounted upon the base member, the gripping elements being generally L-shaped in cross section, two gripping elements being employed to engage a single container;

biasing means for biasing the gripping elements into engagement with the containers and to cause the tops of the containers to firmly engage the base member whereby the containers are covered by the base member to prevent the contents of the containers from spilling during movement;

actuator means for simultaneously moving the gripping elements against the bias of the biasing means to disengage the gripping elements from the containers; and

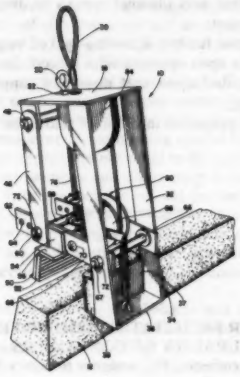
alignment means comprising a plurality of pegs extending from the base member the pegs being arranged in groups with the pegs in each group being spaced from each other and being positioned so as to snugly engage a single container for aligning the containers with respect to the gripping elements.

4,545,609

CURB LIFTING DEVICE

Henry Pasquazzi, and Henry Pasquazzi, Jr., both of 464 Dyer Ave., Cranston, R.I. 02920

Filed Dec. 21, 1983, Ser. No. 564,039
Int. Cl.[4] B66C *1/44*
U.S. Cl. 294—104 4 Claims



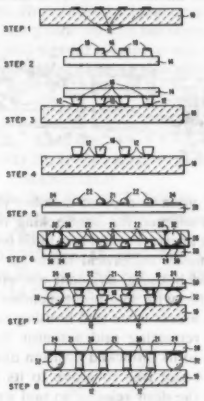
1. A curb lifter adapted to grasp a longitudinally oriented curb from opposed upwardly oriented side portions thereof for the upward lifting thereof comprising a frame having a top wall from which a first fixed support downwardly extends at one end thereof, said first support having a first jaw at the lower end thereof with said jaw provided with a substantially planar inner face for contacting one side portion of said curb, a second support downwardly extending from the other end of said top and provided with a second curb side portion contacting jaw at the lower end thereof such that said jaws are normally laterally spaced apart from each other in a relatively open position, said second support pivotally mounted with respect to said top such that its lower end may move towards said first support to a relatively closed second position wherein said jaws grasp said curb, actuation means for moving said second support to said closed position including first and second pairs of inwardly extending and respectively longitudinally spaced rigid lever arms respectively pivotally attached to said first and second supports and pivotally connected to each other by a rigid longitudinally extending generally centrally disposed main shaft, said lever pairs generally horizontally disposed in said open position and a lifting cable having its lower end extending downwardly through said top and in turn connected to said main shaft wherein upward movement of said cable forces the inner ends of said lever arms upwardly thereby shortening the distance between said lever arm pair support connections so as to in turn force said second support and the second jaw into said second closed grasping position, said actuation means further including a mechanical advantaged pulley system engaged with said cable, said pulley system including an upper first pulley supported by and beneath said top wall proximal said fixed support and a lower second pulley supported by said main shaft disposed below said first pulley, said second pulley mounted in a position above said main shaft and offset towards said fixed support with respect to said main shaft, said cable end connected directly to said main shaft at a position laterally offset from said second pulley connection therewith, and said first pulley being eccentrically positioned so as to overlie the main shaft connection with both said cable end and said second pulley.

4,545,610

METHOD FOR FORMING ELONGATED SOLDER CONNECTIONS BETWEEN A SEMICONDUCTOR DEVICE AND A SUPPORTING SUBSTRATE

Mark N. Lakritz, Wappingers Falls; Jose Ordonez, Pleasant Valley, and Peter J. Tubiola, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1983, Ser. No. 555,264
Int. Cl.[4] H01L *21/44*
U.S. Cl. 29—589 12 Claims



1. A process for forming elongated solder terminals having hour-glass-like shapers to electrically connect a plurality of I/O solder wettable pads on a semiconductor device to a corresponding plurality of solder wettable pads on a supporting substrate comprising,

forming a means to maintain a constant predetermined vertical spacing between said semiconductor device and said supporting substrate, said means being non-deformable at or below the temperature necessary to reflow the solder of the solder terminals,

forming and affixing an extender formed of a low melting metal selected from the group consisting of Pb, Sn, and Pb-Sn alloy to each of said solder wettable pads on said substrate,

positioning said semiconductor device having reflow solder mounds on said solder wettable pads over said supporting substrate with said solder mounds in registry and in contact with said solder extenders affixed to said pads on said substrate, said means to maintain vertical spacing located between and in abutting relation to said device and said support substrate,

heating the resultant assembly to reflow said solder mounds and said solder extenders while maintaining a constant predetermined spacing thus forming a plurality of hour-glass shaped elongated connections.

4,545,611

VAN BODY WITH PLEATED SIDES

Edward G. Broadbent, Sandbach, England, assignor to Tautliner Inc., Indianapolis, Ind.

Filed Dec. 9, 1982, Ser. No. 448,157
Int. Cl.[4] B60J *5/06*
U.S. Cl. 296—181 3 Claims

1. A van body (10) having an open side to provide access to the van body interior for cargo loading and unloading and comprising two end pillars (13), an overhead track (19) bridging and connecting upper ends of the end pillars, a bottom rail (22) bridging and connecting lower ends of the end pillars, the end pillars, overhead track and bottom rail defining the open

access side of the van body, and a side closure assembly mounted on the van body for closing the open access side thereof and being movable to partially open said access side, the side closure assembly comprising:

(a) a pair of solid end doors (**14, 15**) extending between the overhead track and the bottom rail;

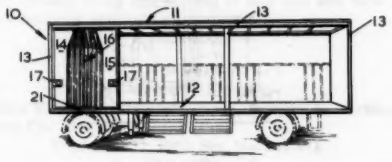
(b) fastening means (**17**) on each end door and the adjacent end pillar for releasably securing the end door to the end pillar;

(c) a flexible curtain (**16**) connecting the two end doors and also extending between the overhead track and the bottom rail;

(d) a plurality of horizontally-spaced, vertical sleeves (**25**) formed in the flexible curtain and extending the full height thereof;

(e) a plurality of rigid members (**24**) individually housed in each vertical sleeve to define successive panels (**23**) of the flexible curtain;

(f) a plurality of runners (**18**) individually connected to a top



of each end door and a top of each rigid member and located in the overhead track for movement therealong;

(g) a plurality of hooks (**21**) individually connected to a bottom of each end door and a bottom of each rigid member and slidably engaging the bottom rail in a non-releasable manner for movement therealong;

(h) at least one pocket (**28**) formed in each curtain panel between a top and a bottom thereof and extending between and normal to two sleeved rigid members defining the panel; and

(i) a resilient biasing strip (**26**) housed in each pocket and configured to urge the curtain panel outwards of the van body for compelling the flexible curtain to form plates when the side closure assembly is moved to open the access side of the van body, each pocket being closed at each end and having a central slit (**29**) through which the resilient biasing strip may be easily inserted into the pocket and removed therefrom if damaged or broken, one end at a time, the egress of the biasing strip being resisted during use.

4,545,612

FRONT SIDE STRUCTURE OF AN AUTOMOBILE BODY

Hayathugu Harasaki, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima

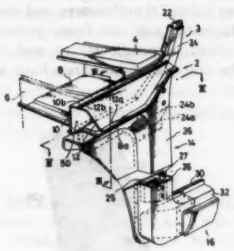
Filed Aug. 24, 1982, Ser. No. 411,007

Claims priority, application Japan, Aug. 26, 1981, 56-134624; Sep. 28, 1981, 56-153141

Int. Cl.[4] B62D *27/00*

U.S. Cl. 296—185 **9 Claims**

1. An automobile body comprising a front side structure comprised of a front pillar having a closed cross-section, a front edge of a side door opening being defined by said front pillar, a dash panel having a substantially horizontal portion extending forwardly from said front pillar, first means provided above said horizontal portion of the dash panel and connected thereto, an upper longitudinal beam having a closed cross-section being formed by said first means and said horizontal portion of the dash panel, said upper longitudinal beam being connected at its rear end with said front pillar, second means provided below said horizontal portion of the dash panel and connected thereto, and a lower longitudinal beam having a closed cross-section being formed by said second means and said horizontal portion of the dash panel, said lower



longitudinal beam being connected at its rear end with said front pillar.

4,545,613

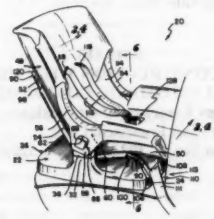
CAR SEAT CARRIER

Lisa Martel, Torrance, Calif.; Roy E. Knoedler, and Donald L. Gerken, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.

Filed Mar. 18, 1983, Ser. No. 476,606

Int. Cl.[4] A47D *1/10*

U.S. Cl. 297—250 **9 Claims**



1. An infant's vehicle chair comprising a base including means for providing an upwardly extending support for resting on the vehicle seat, a seat body, and means for selectively pivotally coupling the seat body to the base, the seat body formed with integral channels which are generally U-shaped in cross section, the channels being closed when viewed from the underside of the seat bottom and back side of the seat back and open when viewed from the top side of the seat bottom and front side of the seat back, the seat body including slots adjacent upper and lower ends of the channels, and a reinforcing member extending in the channels to reinforce the seat body and having portions extending through the slots and with one portion extending along a portion of the back side of the seat, a loop for engagement by a vehicle seat belt, and means for attaching the loop to the chair to anchor the chair to the vehicle seat.

4,545,614

THIN ELASTOMERIC SEAT

Ismat A. Abu-Isa, Rochester, and Dorthie J. McIntyre, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 9, 1984, Ser. No. 578,686

Int. Cl.[4] A47C *3/00*

U.S. Cl. 297—284 **3 Claims**

1. A vehicle seat assembly comprising,

tubular frame means including laterally spaced, generally horizontal side frame portions for supporting a seat and

laterally spaced, generally vertically extending side frame portions for supporting a backrest,

said seat and backrest each comprising a multiplicity of individual side by side located elastomeric filaments of a diameter between 0.2 to 2.0 millimeters, and whose opposite ends are attached to said side frame portions so that the filaments extend perpendicular to said side frame portions whereby said seat and backrest have a thickness which is thin,

said elastomeric filaments being made from a material having a substantially higher tensile strength and a modulus of elasticity at 100 percent elongation which is at least five times more than natural rubber,

and said elastomeric filaments being prestretched in the range between 20 and 100 percent elongation when attached to said side frame portions.

4,545,615

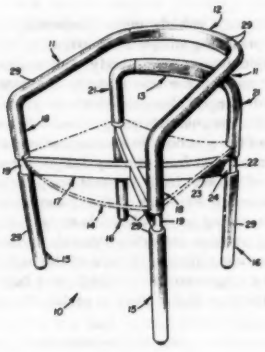
FURNITURE CONSTRUCTION WITH REPLACEABLE ELASTOMERIC COVERING

Brian J. Kane, San Francisco, Calif., assignor to Metropolitan Furniture Corp., San Francisco, Calif.

Filed Sep. 6, 1983, Ser. No. 529,618

Int. Cl.⁴ A47C *3/00*

U.S. Cl. 297—287 **14 Claims**



1. A seating unit comprising

a pair of laterally spaced front legs,

a pair of laterally spaced rear legs,

a pair of laterally-spaced armrests having forward portions thereof secured directly to upper ends of said front legs,

a first horizontally disposed backrest secured directly and solely to said armrests, a second backrest disposed horizontally and at least approximately vertically below said first backrest and being in unattached relationship therewith and secured directly and solely to said rear legs,

a seat secured in said seating unit between said front and rear legs, and

a replaceable and exposed protective covering secured over at least some of said armrests, backrest, legs, and seat, said covering composed of an elastomeric cushioning material adapted to absorb impact loads imposed thereon.

4,545,616

MOBILE CHAIR WITH ELEVATING SEAT

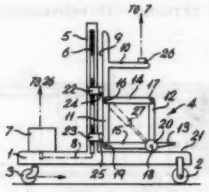
Eric Booth, Didcot, England, assignor to National Research Development Corporation, London, England

Filed Feb. 22, 1984, Ser. No. 582,471

Claims priority, application United Kingdom, Feb. 25, 1983, 8305331

Int. Cl.⁴ A47C *1/02*

U.S. Cl. 297—320 **4 Claims**



1. An invalid carriage comprising:

a chassis;

a chair of pivotted framework construction including a seat and front legs, said front legs receiving support from said chassis;

a mast fixed to said chassis;

a connection between the rear of said seat and said mast, and means to raise and lower said connection up and down said mast, whereby when so raising said connection to tilt said seat into a forwardly-sloping orientation and so assist a user to rise from said seat into a near-standing position, and when so lowering said connection again to return said seat from a forwardly-sloping orientation to horizontal and so facilitate the change in position of an intending user of said chair from standing to sitting;

and in which the means of said support of said front legs on said chassis are movable, whereby when said connection rises up said mast said movable support means move backwards over said chassis towards said mast.

4,545,617

SAFETY AUTOCAR CHAIR FOR CHILDREN

Joannes H. Drexler, Postbus 18, 6980 AA Doesburg, and Wolfram J. P. Peters, Laan van Overvest 20, 2613 Delft, both of Netherlands

Filed Sep. 1, 1983, Ser. No. 528,518

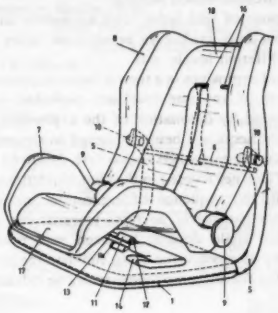
Claims priority, application European Pat. Off., Oct. 8, 1982, 82201259.7

Int. Cl.⁴ B60N *1/12*

U.S. Cl. 297—340 **4 Claims**

1. A child's safety chair adjustable into a sitting and reclining position comprising a seat and a back pivotally connected end to end with each other, a horizontal base having a pair of spaced parallel arms extending upwardly and rearwardly therefrom, means pivotally connecting said back to said upstanding arms parallel the axis of the pivotal connection between the seat and back, first and second boss means secured to each of said seat and base respectively, first pivot means journalled in said first boss means along an axis parallel to the axis of the pivotal connection between the seat and back, second pivot means journalled in said second boss means parallel to said first pivot means said first and second pivot means being

coupled together for conjoint rotation, whereby said first pivot means is movable arcuately about said second pivot means



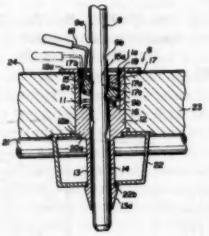
thereby causing lifting and shifting of said seat and back between a reclining and a sitting position.

4,545,618

HEAD-REST DEVICE

Masahiro Kitamura, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Feb. 22, 1984, Ser. No. 582,472
Int. Cl.⁴ A47C *1/10*
U.S. Cl. 297—410 **9 Claims**



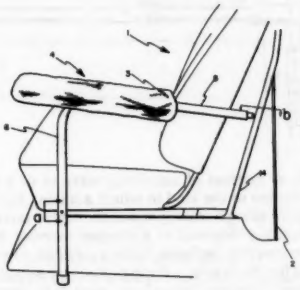
1. A head-rest device comprising:
an elongate head-rest stay;
a head-rest holder mountable to an upper portion of a seat back for vertically receiving said head-rest stay therethrough; and
lock means contained within said head-rest holder for removably restricting the vertical movement of said head-rest stay, wherein,
said head-rest stay includes, on its circumferential surface, means defining plural pairs of vertically spaced-apart slotted recesses, one slotted recess of each said pair of slotted recesses being vertically staggered relative to the other slotted recess of said pair of slotted recesses such that said one and other slotted recess for each said pair establish a respective engagement portion which is angularly inclined relative said head-rest stay;
said lock means including,
(i) an engagement body defining a stay-insertion bore having a diameter substantially equal to that of said head-rest stay for slidably receiving said head-rest stay, said bore establishing a pair of engagement edge portions respectively selectively engageable with said one and other slotted recesses of a predetermined slotted recess pair, said engagement body being movable between (a) an engaged position wherein said engagement body is in an angularly-inclined relationship to said head-rest stay to effect respective engagement between said pair of engagement edge portions and said one and other slotted recesses of said predetermined slotted recess pair thereby preventing vertical adjustment of said head-rest stay, and (b) a disengaged position wherein said pair of engagement edge portions are disengaged from said one and other slotted recess of said predetermined slotted recess pair to permit said head-rest stay to be slidable relative said base,
(ii) an externally-projecting operation lever to permit said engagement body to be manually moved between said engaged and disengaged positions, and
(iii) retaining means for retaining said engagement body in said inclined engaged position.

4,545,619

DETACHABLE ARM REST FOR A MOTOR VEHICLE

Moses D. Garay, 1610 Fallbrook Ave., San Jose, Calif. 95130

Filed Nov. 1, 1982, Ser. No. 438,248
Int. Cl.⁴ A47C *7/54*
U.S. Cl. 297—416 **11 Claims**



1. A detachable arm rest for a bucket type seat comprising:
a vertical support member having one end thereof adapted to rest on the floor of the vehicle adjacent the inboard side of a seat support member;
means for interconnecting said vertical support member with said seat support member at a position near the forward edge and on the inboard side thereof comprising a rod attached to said vertical support at a location that is above that of said seat support member and inclined at an angle so as to intersect the inboard side of said seat support near the forward edge thereof and to mate with an opening in said seat support;
a horizontal support member having one end thereof adapted for attachment to the other end of said vertical support member;
means for interconnecting said horizontal support member with the inboard side of the back rest portion of said seat support member; and
table means for providing said arm rest, said table means being adapted for attachment to said horizontal support member.

4,545,620

PROCESS FOR THE RECOVERY OF A MINERAL

Daniel J. Curtin, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 15, 1978, Ser. No. 969,920
Int. Cl.⁴ E21B *43/28*
U.S. Cl. 299—4 **9 Claims**

1. An improved process for the solution mining of a mineral from a subterranean formation containing same in which an injection and production well are drilled and completed within said formation. leach solution and an oxidant are injected through said injection well into said formation to dissolve said mineral, and said dissolved mineral is recovered via said pro-

duction well, wherein the improvement comprises periodically ceasing the injection of said leach solution subsequent to a decline in the concentration of said mineral in said solution recovered via said production well while continuing production to alter the flow path of said leach solution in said formation between said injection and production wells and subsequently injecting said leach solution.

4,545,621

MINING INSTALLATION EQUIPMENT

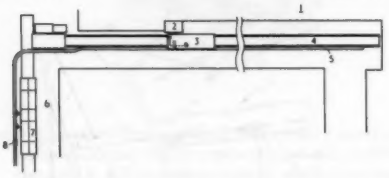
John Sharp, Doncaster, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sep. 15, 1983, Ser. No. 532,500

Claims priority, application United Kingdom, Oct. 15, 1982, 8229605

Int. Cl.⁴ F21C *37/00*

U.S. Cl. 299—12 **15 Claims**



14. A method of supplying services to a longwall mining installation of the kind in which a mining machine is arranged to move along a conveyor and to receive surfaces from a series of conduits disposed in a channel member located alongside the conveyor, includes feeding conduit means carrying services for the machine through sleeve means extending into the channel member through an open side thereof, closing said open side with flexible sealing means and causing the sleeve means to open said means as it is moved by the machine along the conveyor, and feeding a gas through said channel member and sleeve means to the machine, wherein the conduit means is sheathed and substantially rectangular, and disposed longitudinally within the channel member, whereby movement of the machine causes the conduit means to form a loop within the channel member by bending about its largest dimension.

4,545,622

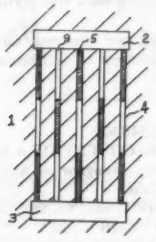
METHOD OF RUBBLIZATION FOR IN-SITU OIL SHALE PROCESSING

Lien C. Yang, 2107 Normanton Dr., La Canada-Flintridge, Calif. 91011

Filed Oct. 13, 1983, Ser. No. 541,517

Int. Cl.⁴ E21B *41/10, 43/247*

U.S. Cl. 299—2 **5 Claims**



4. A method for rubblization of oil shale deposits comprising the steps of:

a. excavating rooms above and below the oil shale deposit to be rubblized;

b. drilling a series of holes vertically through the oil shale deposit, the room, above said deposit and the room below said deposit, said holes being parallel to one another and arrayed in a predetermined pattern;

c. loading portions of said holes with explosives disposed therein so that said explosives in adjacent holes in the array are at different levels; and

d. detonating said explosives in a time delayed sequence such that explosives at any one level are exploded simultaneously followed by detonation of the explosives at another level, the sequence being designed to detonate the charges nearest the excavated rooms first, followed by the detonation of charges located in the central portions of the shape deposit, the sequence of explosions progressing from the upper and lower portions towards the central portion of the shale deposit between said excavated rooms, thereby to more completely rubblize the oil shale so that the oil in the shale may more easily be extracted by retorting.

4,545,623

MONITORING CIRCUIT FOR AN ANTILOCK BRAKING SYSTEM THAT DETECTS A SMALLER DIAMETER TIRE

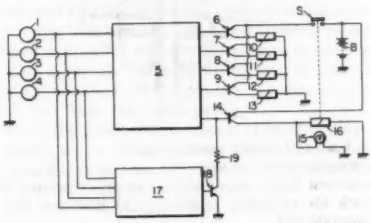
Makoto Sato, Kamifukuoka, and Yoshikazu Tsuch, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,710

Claims priority, application Japan, Jul. 2, 1982, 57-115025

Int. Cl.⁴ B60T *8/08*

U.S. Cl. 303—92 **7 Claims**



1. An antilock braking apparatus for a wheeled vehicle having braking means including antilock control means, comprising:

a plurality of wheel speed signal generating means adapted to generate wheel speed signals proportional to angular speed of each of a plurality of wheels of said vehicle;

small-diameter tire detecting means comprising wheel speed difference signal generating means adapted to generate a wheel speed difference signals each of which indicates a value of difference in the level of said wheel speed signals derived from each pair of two pairs of said wheels arbitrarily selected;

said small-diameter tire detecting means further comprising means for determining from said difference signals when one of said wheels has a diameter different from the diameters of the other of said wheels and means for generating a release signal in response to such a determination; and

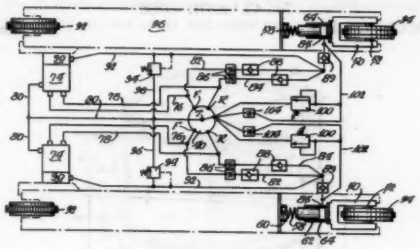
means responsive to said small-diameter tire detector release signal for releasing said antilock control means, whereby said antilock control means will be inoperative when said vehicle has one smaller diameter tire.

4,545,624

CRAWLER TRACK TENSIONING AND DRIVE SYSTEM

Richard C. Van Ooyen, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Feb. 16, 1983, Ser. No. 466,872
Int. Cl.[4] B62D *55/00, 55/30*
U.S. Cl. 305—9 5 Claims



1. A crawler track tensioning and drive system, comprising:
a carriage and a pair of endless crawler tracks rotatably mounted on the carriage;
a pair of hydraulic drive motors respectively associated with said crawler tracks for driving said tracks;
means for supplying pressurized hydraulic fluid to each of said hydraulic motors to provide motive power therefor;
a pair of hydraulic tensioning cylinder assemblies respectively associated with said crawler tracks for tensioning said tracks;
means for tensioning each of said tracks by pressurization of the associated one of said hydraulic tensioning cylinder assemblies responsively to the torque applied to the track by its associated one of the hydraulic motors,
said tensioning means comprising at least one branched hydraulic fluid line for each said track communicating with said fluid supply means, the branched hydraulic line for each said track being adapted to supply pressurized fluid from said fluid supply means to the tensioning cylinder assembly associated with the track;
a pair of track brakes respectively associated with each of said crawler tracks, each said track brake being releasable by pressurization with hydraulic fluid supplied by a further branch hydraulic fluid line of each of said branched hydraulic fluid lines, and means for preventing reverse fluid flow from each said further branch line to said fluid supplying means; and fluid bleed line means communicating with each said cylinder assembly for permitting constant, relatively limited fluid flow therefrom, each said further branch hydraulic fluid line communicating in fluid flow relation with the respective one of said cylinder assemblies via one-way flow check means for preventing fluid flow from each said cylinder assembly to the respective one of said further branch hydraulic fluid lines, whereby said fluid bleed line means are arranged to effect bleeding of fluid from said further branch hydraulic fluid lines for relieving fluid pressure in said further branch hydraulic fluid lines for effecting actuation of said track brakes.

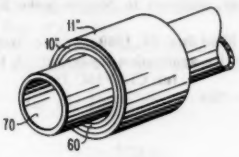
4,545,625

PRESTRESSED CYLINDRICAL SQUEEZE BEARING MEMBER

Mats A. Engwall, Hollister, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,661
Int. Cl.[4] F16C *32/04, 32/06*
U.S. Cl. 308—5 R 4 Claims

1. A cylindrical squeeze bearing system including first and second cylindrical bearing elements coaxially nested about a longitudinal axis, the first bearing element being the radially inner element including a hollow cylindrically shaped single-piece radially polarized piezoelectric element and another hollow cylindrically shaped single-piece element located radially outer of the piezoelectric element and in contact with the entire outer cylindrical surface of the piezoelectric element for



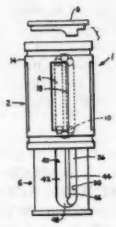
placing said piezoelectric element in sufficient radial and circumferential compression to minimize tensile stress while said first and second bearing elements are functioning as a squeeze bearing system.

4,545,626

LINEAR BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Incom International Inc., Pittsburgh, Pa.

Filed Feb. 6, 1984, Ser. No. 577,480
Int. Cl.[4] F16C *29/06*
U.S. Cl. 308—6 C 11 Claims



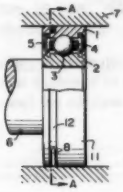
1. Linear bearing apparatus comprising a shell, linear races connected to the shell and extending transversely therefrom, the race having at one transverse extension thereof a track for receiving balls between the race and a device on which the bearing moves, and a cage for mounting within the shell, the cage having a recirculating guideway for forming with the shell a path for recirculating guideway for forming with the shell a path for recirculating balls, the cage having means for permitting the cage to be insertable axially in the shell, and cap means mountable at one end of the shell for connecting to the shell and to the cage, the cap means having guideway completing means for completing the guideway; and wherein the cage has an open end for guiding along races embedded in the shell and extending inward from the shell and wherein the open end of the cage includes an axial opening in the guideway whereby the guideway slides along inward extended portions of the races and wherein the cap means closes the open end of the cage and closes the axial openings in the guideway and cooperates with the cage to complete the guideway.

4,545,627

CREEP PREVENTING DEVICE OF AN ANNULAR MEMBER

Mitsugu Nakamura, Yokohama; Satoru Yoshizu, Fujisawa; Teiichi Sakata, Yokohama, and Hiroyuki Yatabe, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Japan

Filed Jun. 18, 1980, Ser. No. 160,631
Claims priority, application Japan, Jul. 13, 1979, 54-95734[U]
Int. Cl.[4] F16C *33/30*
U.S. Cl. 384—585 5 Claims



1. A creep preventing device for preventing creep occurring between an annular member and a partner member fitted to said annular member, said device including:

a circumferential groove formed in the peripheral surface of said annular member eccentrically with respect to said peripheral surface; and

a resilient ring member fitted in said circumferential groove and having a circumferential length greater than one half of the circumferential length of said circumferential groove, said ring member having at least one bulged portion extending to a height greater than the maximum depth of said circumferential groove, said resilient ring member having a thickness at its ends greater than the depth of the minimum depth portion of said circumferential groove;

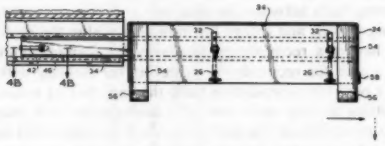
whereby an edge of one end portion of said resilient ring member may wedge itself into the minimum space portion of the eccentric space formed between said circumferential groove and the peripheral surface of the partner member and the central portion of said bulged portion may be urged against the partner member as the opposite ends of the bulged portion are urged against the bottom of said circumferential groove, thereby preventing creep of the annular member.

4,545,628

TOOL CHEST WITH RETRACTABLE STEP

Clyde D. Richey, Jamestown, N.Y., assignor to The Jacobs Manufacturing Co., Tallmadge, Ohio

Filed Feb. 17, 1984, Ser. No. 581,119
Int. Cl.[4] A47B *83/04*
U.S. Cl. 312—235 A 7 Claims



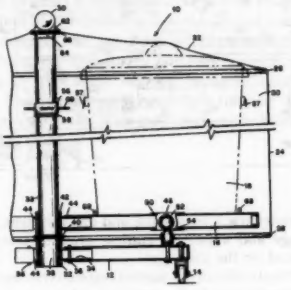
1. In a tool chest for mechanics tools which chest is mounted on wheels to provide convenient mobility upon a floor, a step affixed to and retained beneath the bottom of the tool chest above the floor, means for moving said step horizontally from beneath the tool chest said step held by said tool chest by resilient means out of contact with the floor, said resilient means permitting vertical downward movement of the step, after the step is moved from beneath the tool chest, in response to a weight being placed upon the step, so that the step contacts the floor.

4,545,629

ROTATING GARBAGE CAN RACK WITH COVER

Kenneth P. Hackett, 5209 Franklin Rd., Nashville, Tenn. 37220

Filed Feb. 28, 1983, Ser. No. 470,316
Int. Cl.[4] A47B *49/00*
U.S. Cl. 312—252 12 Claims



1. An apparatus for supporting and protecting a plurality of garbage cans, comprising:

a base having an upper and a lower surface;

a post extending generally vertically upwardly from said base;

garbage can support means for supporting the plurality of garbage cans,

a plurality of rollers disposed between said base and said garbage can support means, said rollers being radially spaced-apart from said post;

said garbage can support means being supported for rotation above said base by said rollers so that said garbage can support means is rotatable about said post on said rollers, said garbage can support means being configured to receive and support the plurality of garbage cans in an upright position on the upper surface of said support means;

single flexible cover means for covering the plurality of garbage cans when supported on said garbage can support means;

attachment means for detachably attaching said flexible cover means to the top of said post so that said cover means is removable from the apparatus.

4,545,630

COVER APPARATUS FOR WEIGHING MACHINES

Asashiro Izumi, and Yoshiharu Mikami, both of Kurita, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

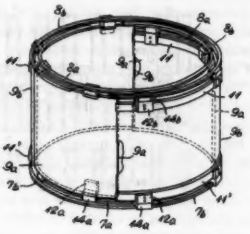
PCT No. PCT/JP81/00395, § 371 Date Aug. 31, 1982, § 102(e) Date Aug. 31, 1982, PCT Pub. No. WO82/02430, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 17, 1981, Ser. No. 417,117
Claims priority, application Japan, Jan. 9, 1981, 56-2064[U]; Jul. 11, 1981, 56-103020[U]
Int. Cl.[4] A47B *81/00*; E06B *3/46*
U.S. Cl. 312—285 2 Claims

1. A cover apparatus, comprising:

a plurality of peripherally divided and interconnecting cover sections positioned around and outside a plurality of weighing machines arranged in turn in a predetermined array or pattern, said cover sections encircling conjointly said weighing machines in their entirety;

an annular upper inner rail;

an annular upper outer rail, said upper inner and outer rails concentric with respect to each other;
an annular lower inner rail;
an annular lower outer rail, said lower inner and outer rails concentric with respect to each other;
one or more arcuate inner cover sections slidable circumferentially on said upper and lower inner rails,
one or more arcuate outer cover sections slidable circumferentially on said upper and outer rails, each outer arcuate



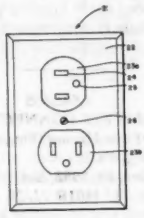
section having reinforcement plates mounted on the outside thereof at their upper and lower ends and each inner arcuate section having reinforcement plates mounted on the inside thereof at their upper and lower ends, and wherein each of said inner and outer arcuate sections has a grooved slide at their upper and lower ends engageable with said respective rails, each said grooved slide being mounted on a metallic fixture, which is in turn mounted to one of said reinforcement plates and one of said arcuate sections.

4,545,631

OFFSET ELECTRICAL OUTLET

William A. Zampini, 21 Water St., Fairport, N.Y. 14450

Filed Sep. 7, 1984, Ser. No. 648,258
Int. Cl.⁴ H01R *13/00*
U.S. Cl. 339—14 R **2 Claims**



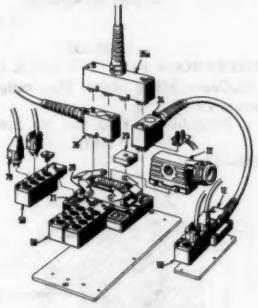
1. An electrical wall outlet comprising:
a first plug receptacle having a pair of contact apertures and a ground aperture designed for accommodating a standard electrical plug and
a second plug receptacle having a pair of contact apertures and a ground aperture designed for accommodating a standard electrical plug, wherein the orientation of the pair of contact apertures of the second plug receptacle is offset from the orientation of the pair of contact apertures of the first plug receptacle by at least 30°.

4,545,632

MODULAR ELECTRICAL DISTRIBUTION CONNECTION SET

Gernot Maier, Stuttgart; Heinrich Tischler, Gerlingen; Rolf Wöhr, Leonberg, and Wolfgang Schwarzhoff, Lüdenscheid, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,710
Claims priority, application Fed. Rep. of Germany, Nov. 26, 1982, 3243727
Int. Cl.⁴ H01R *29/00*
U.S. Cl. 339—18 R **14 Claims**



1. Modular electric distribution connection set comprising
a central distribution module having a plurality of electrical main terminals, the module including a box-like structure, the terminals being positioned essentially centrally thereof;
a plurality of identical modular multi-terminal connection sockets positioned on either side of the main electrical terminals, in aligned rows, each modular socket having a plurality of connection receptacle or socket terminals located in a predetermined configuration;
a conductor support plate having electrical connections thereon located inside the box and connecting selected ones of the main terminals with selected ones of the receptacle or socket terminals of the multi-terminal sockets,
a remote socket element having a housing and a multi-terminal remote connection socket mounted therein identical to the modular multi-terminal connection sockets;
a plurality of modular plug units having a plurality of identical projecting prongs located in mirror image of said configuration, and being dimensioned and shaped to fit into said connection or socket terminals and being selectively connectable and disconnectable from the terminal connection sockets, said plug units including at least one each of:
an adapter element comprising a set of projecting prongs adapted to fit into one of the connection sockets for connection to a load;
a tandem plug unit having at least two sets of projecting prongs positioned to fit into the receptacle or socket terminals of at least two adjacent sockets and adapted for connection to a selected external load;
and a distribution strip having a housing structure and, secured to said strip, a distribution plug unit identical to any one of said plurality of separable plug units, and including, within said housing structure, a distribution conductor support plate having electrical conductors thereon, the housing structure further comprising
a plurality of power distribution sockets each having a plurality of plug-in terminals, wherein the plurality of plug-in terminals comprises a lesser number of terminals than the number of terminals of said connection receptacle or socket terminals,
the plug-in terminals being connected electrically to the

electrical connections on the distribution conductor support plate;

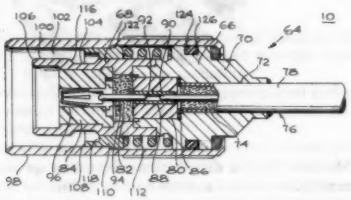
and wherein each of said sockets and each of said plug units includes interengaging threaded bolt-and-sleeve elements, one of said elements being located on the socket, and the other of said elements being located on the plug unit, one of said elements being rotatable and axially essentially fixed to provide for screw-in engagement of plug units with respective sockets while insuring positive ejection of plug units from the sockets upon turning of the respective rotatable element in removing direction.

4,545,633

WEATHERPROOF POSITIVE LOCK CONNECTOR

Peter G. McGeary, Hobe Sound, Fla., assignor to Whittaker Corporation, Calif.

Filed Jul. 22, 1983, Ser. No. 516,404
Int. Cl.⁴ H01R *13/44*
U.S. Cl. 339—42 **5 Claims**



1. An improved, weatherproof, snap-on, positive lock connector device for electrical conduits, said device comprising, in combination:

a. a male plug comprising a housing having

i. a central tubular component having a cavity extending therethrough adapted to receive an electrical conduit at the rear end thereof,

ii. a plurality of flexible fingers extending forwardly from the front end of said tubular component, said fingers having terminal pads,

iii. a sleeve concentric with and peripheral of said fingers to define with said fingers a peripheral space therebetween, and,

iv. sealing means disposed in said space and around said tubular component for thermally sealing said tubular component against atmospheric conditions;

b. a female receptacle comprising a housing having

i. a central tubular member having a cavity extending therethrough adapted to receive an electrical conduit at the rear end thereof,

ii. a plurality of spaced peripheral recesses in the outer surface of said tubular member aligned with and adapted to receive said fingers,

iii. a sleeve concentric with, slideable over and peripheral of said tubular member to define a peripheral space therebetween, said sleeve being receivable within said male plug sleeve,

iv. locking means comprising tabs in said female receptacle peripheral space movable between a forward locked position over said recesses and a rearward unlocked position away from said recesses, said tabs being automatically urgeable into said unlocked position by said finger pads during engagement of said male plug and female receptacle,

v. spring means urging said locking means into said locked position and said sleeve into a forward position, and;

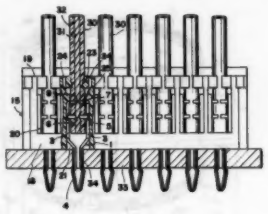
vi. sealing means for thermally sealing said female receptacle against atmospheric conditions.

4,545,634

MULTI-CONTACT CONNECTOR

Yoshihiro Saijo, Ibaragishi, Japan, assignor to Nippon Achakutanshi Seizo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1982, Ser. No. 451,091
Claims priority, application Japan, Dec. 19, 1981, 56-190058[U]
Int. Cl.⁴ H01R *11/20, 13/50, 13/58*
U.S. Cl. 339—97 P **11 Claims**



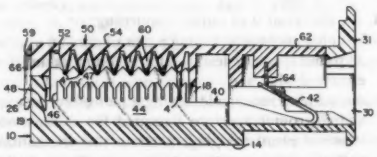
1. An electrical connector arrangement comprising a housing means, at least one contact means for enabling a connection with an electrical means, the at least one contact means includes an electrical connection section and a holding section for accommodating an electrical conductor means associated with the at least one contact means, the holding section includes first and second spaced side walls and first and second contact walls spaced from each other in a longitudinal direction of the electrical conductor means, each of said contact walls having arranged therein a first slot for accommodating the electrical conductor means in an electrically conductive manner, and a first means provided on at least one of said first and second side walls for preventing a lateral expansion of the slot therein upon an insertion of the electrical conductor means, a second means for preventing said electrical connection from displacing in a longitudinal direction upon insertion of the electrical conductor means, said first means including an ear portion and a recess portion adapted to receive said ear portion, said recess being provided in said first and second side walls, said first and second side walls including pawls at forward corners thereof for enabling a connection with said housing means, said housing means including a second slot in alignment with said first slots, and a hole through which the at least one contact means is accommodated in the housing means, said second means includes projecting walls provided in said housing means against which the contact means is abutted when the same is accommodated in the housing means, said pawls being engaged with said hole thereby securing the contact means to the housing means.

4,545,635

MATRIX CONNECTOR

Edward D. Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1983, Ser. No. 543,591
Int. Cl.⁴ H01R *11/20, 23/66*
U.S. Cl. 339—99 R **4 Claims**



1. An electrical connector for programmable interconnec-

tion between a plurality of contacts and a like plurality of wires comprises:

a base of dielectric material having a first surface;

a plurality of conductive terminals mounted on said first surface, each said terminal being formed integrally with a respective contact each said terminal having an elongate plate portion with oppositely directed first and second edges, said plates being arranged in a substantially planar array with said first edges inserted into said first surface, each said second edge having a like plurality of wire receiving portions thereon having respective wire receiving slots at like spacing, said wire receiving portions extending away from said first surface, each said plate lying parallel to said other plates, said wire receiving slots of adjacent plates forming a like plurality of rows of slots, said base further comprises parallel barrier walls extending from said first surface, one barrier wall lying between each adjacent pair of plates, each barrier wall having a like plurality of slots therein, said slots in said barrier walls being aligned with said slots in said plates, said slots in said plates having wire lead-ins terminating closer to said first surface than said slots in said barrier walls whereby, said slots in said barrier walls serve to align said wires with said slots in said plates while keeping said wires spaced therefrom except where insertion tooling is applied, the barriers formed to support a portion of each said wire above and out of contact with certain ones of said plates while another portion of each said wire extending between two of the barriers is bent downwardly into a slot of another one of said plates, whereby,

upon laying a like plurality of wires in a planar array against said base and perpendicular to said plates with each wire overlaying a row of slots in said terminals, any wire may be connected to any contact by inserting said wire into the underlying slot of the terminal having said contact.

4,545,636

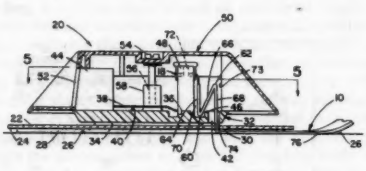
METHODS OF AND ASSEMBLIES FOR STRAIN RELIEVING CONNECTORIZED FLAT CABLE

Charles M. Beatenbough, Buford, Ga., and William A. Elliott, Reynoldsburg, Ohio, assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,365

Int. Cl.[4] H01R *13/585*

U.S. Cl. 339—105 **6 Claims**



1. A method of strain relieving a flat flexible cable to be terminated to a connector mounted a base housing unit having an elongated slot formed in a bottom wall of the housing, which comprises:

passing a leading end section of said flat cable through said elongated slot;

deforming said leading end section of said cable to form a pair of permanent creases and three successive flexible accordion pleat sections;

positioning said pleat sections within the base housing unit between said slot and said connector; and

flexing said pleat sections in response to tension applied to the cable by first moving a first of said pleat sections and a first crease formed between the first and a second pleat sections toward the connector to press the first crease into binding engagement with said connector, and then moving a third pleat section into binding engagement with an edge of said slot thereby relieving strain from the connector-terminated end of the cable.

4,545,637

PLUG CONNECTOR AND METHOD FOR CONNECTING SAME

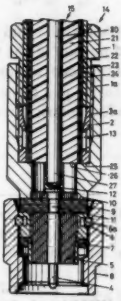
Andreas Bosshard, and Bernhard Lämmler, both of Herisau, Switzerland, assignors to Huber & Suhner AG, Herisau, Switzerland

Filed Nov. 23, 1983, Ser. No. 554,764

Claims priority, application Switzerland, Nov. 24, 1982, 6857/82

Int. Cl.[4] H01R *17/18*

U.S. Cl. 339—177 E **5 Claims**



1. A plug connector for coaxial cables, particularly for flexible coaxial cables having an inner conductor (**20**), a dielectric layer (**21**), a first covering (**22**) made of an overlapping coiled metal foil band, a second covering (**23**) made of woven wire and an exterior cover (**24**), which plug connector (**14**) comprises a plug pin (**4**) electrically connected with the inner conductor (**20**), an insulator (**5**) which surrounds said plug pin (**4**) over at least part of its length, and a plug housing (**3**) which is electrically connected with at least one of the two coverings (**22, 23**), characterized in that a clamping contact ring (**2**) which closely surrounds the second covering (**23**) is provided between a nipple (**1**) having an exterior threaded section (**1***a*) and surrounding the exterior cover (**24**) and the plug housing (**3**) which is provided with an interior threaded section (**3***a*) for a threaded connection with the nipple (**1**), the end surface (**25**) of which contact ring (**2**) is in a common plane with the end surface (**26**) of the dielectric layer (**21**) and the cut surfaces of the two coverings (**22, 23**), in that the inner conductor (**20**) projects beyond the above-mentioned plane and is electrically connected with the plug pin (**4**) in an axial hollow chamber (**12**) thereof, and in that the plug housing (**3**) includes a sleeve (**3***b*) which projects beyond the mentioned plane, on the outer surface of which sleeve (**3***b*) is mounted a connecting sleeve (**8**), which is mounted so as to be rotationally movable and capable of only limited axial movement, the contact ring (**2**) being soldered to the second covering (**23**) and the first covering (**22**) completely around the periphery of the cable at the end of the coverings.

4,545,638

RIB CAGE TERMINAL

Douglas A. Neidich, Harrisburg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

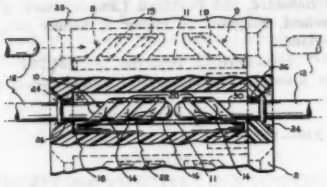
Filed Jun. 21, 1982, Ser. No. 390,510

Int. Cl.[4] H01R *13/02*

U.S. Cl. 339—205 **9 Claims**

1. A female electrical terminal comprising an electrically conducting rib cage mounted on a first end of an elongated planar spine and another electrically conducting body on a

second end of the spine separated by a bridging mid-portion, the rib cage enclosing a pin receiving cavity created by at least two pair of ribs in the form of curved cantilevered beams angled uniformly toward the first end of the spine and attached at one end to the spine and spaced apart at its other end from



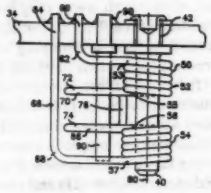
a corresponding beam, each beam being at an acute angle with respect to the mid-portion of the spine, the rib cage having a diameter sufficient to accept a round or square pin inserted into the pin receiving cavity in a plane substantially parallel to the plane of the spine for electrical termination.

4,545,639

MOVABLE ELECTRICAL CONTACT CAPABLE OF ACCOMMODATING DEVICES EXHIBITING A PLURALITY OF DIFFERENT SIZES

Irving H. Holden, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1983, Ser. No. 511,426
Int. Cl.[4] H01R *9/12*
U.S. Cl. 339—256 R **7 Claims**



1. An electrical contact assembly comprising:

housing means for containing a device to be electrically contacted, said housing means including a mounting surface;

a torsion spring having a coil axis situated perpendicular to said mounting surface, said torsion spring including coil ends and a movable contact region,

mounting means for mounting said torsion spring perpendicular to said mounting surface,

holding means for holding said torsion spring contact region in a first predetermined position, said contact region being deflectable to a second predetermined position depending on the size of the device to be contacted,

said movable contact region comprising a V-shaped member, when viewed along the line of said coil axis, having first and second ends and a center point, said first end being mechanically connected to at least one of said coil ends to provide spring action to said V-shaped member, and

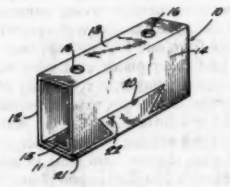
the second end of the V-shaped member including a hook-shaped portion for engaging said holding means.

4,545,640

ELECTRICAL SPLICING CONNECTOR

Harold W. Buchberger, North Lake, Wis., assignor to Curtis Industries, Milwaukee, Wis.

Filed Nov. 25, 1983, Ser. No. 555,174
Int. Cl.[4] H01R *4/36*
U.S. Cl. 339—272 R **4 Claims**



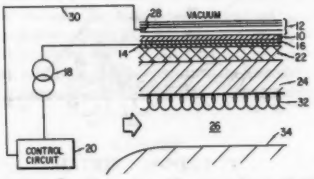
1. In an electrical connector comprising a rectangular sleeve, and openings in the sleeve receiving a pair of threaded electrical conductor clamping members having clamping ends, the improvement comprising: said sleeve being formed from a linear series of five main panels of which the first panel of the series and the last panel of the series overlap to form a single side of the rectangle, an opening in a side of the sleeve formed in a panel adjacent to the overlapping panels, the opening being narrowest nearest the clamping ends of the threaded clamping members, and a tab formed as a sixth panel adjacent to one of the overlapping panels at one end of the linear series of panels forming the sleeve which is complementary in shape to said opening and is placed in said opening during formation of the sleeve to prevent opening of the sleeve when the clamping members are clamped.

4,545,641

HIGH SPEED ERASING AND REBIASING OF THERMOPTIC THIN FILMS IN THE MEDIUM AND LONG-WAVE INFRARED

Arthur E. Sobey, Jr., Richardson, Tex., assignor to LTV Aerospace and Defense, Dallas, Tex.

Filed May 10, 1983, Ser. No. 493,338
Int. Cl.[4] G02F *1/19*
U.S. Cl. 350—1.1 **13 Claims**



1. In an optical modulator apparatus for erasing and rebiasing a thermoptic thin film adapted for modulating infrared light in a predetermined infrared spectral band by affecting a transition between a metallic state and a semiconductor state, the improvement being a plurality of thin layers cooperating to enhance said erasing and rebiasing cycle while maintaining an optical geometry effective to obtain a radiant exitance of said modulator corresponding to a blackbody at a lowest temperature expected to be simulated for modulation, said plurality of thin layers comprising:

a layer of thermal insulating material having a high optical transmittance over said predetermined infrared spectral band and disposed beneath said thermoptic thin film,

a layer of semiconductor resistive material disposed between said thermoptic thin film and said thermal insulating layer

and having a high optical transmittance over said predetermined infrared spectral band and a resistivity effective to produce Joule heating at a selected rate, and

a plurality of dielectric films adjacent said thermoptic film having composite thickness and optical characteristics in series with said

thermoptic film, said layer of thermal insulating material, and said layer of semiconductor resistive material cooperating to obtain an optical shift from reflectance to transmittance conditions for incident radiation in said predetermined spectral band when said thermoptic layer transitions between said metallic state and said semiconductor state, respectively.

4,545,642
PRISM COUPLER DEVICE FOR AN OPTICAL WAVEGUIDE

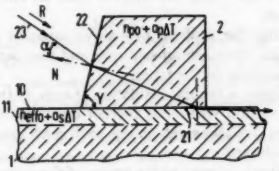
Franz Auracher, Buchenhain bei Baierbrunn, and Rudolf Keil, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,326

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112939

Int. Cl.⁴ G02B 5/14

U.S. Cl. 350—96.19 **5 Claims**



1. A prism coupler for coupling radiation into and out of an optical waveguide at a selected temperature range ΔT, said waveguide having an index of refraction n_{eff}, said coupler comprising a first prism of a material having an index of refraction n_p, said first prism having a base surface and a coupling surface extending at a prism angle γ' to the base surface, at least one second prism of a material which is different than the material of the first prism and having an index of refraction n_p, said second prism having a base surface, a coupling surface extending at a prsim angle β and an additional coupling surface, said first and second prisms being disposed with their base surfaces engaging the waveguide with the additional coupling surface being parallel to the coupling surface of the first prism and in surface contact therewith, and the coupling surface of the second prism being positioned to receive radiation in a direction R at a coupling angle α with a normal to the coupling surface of the second prism and with the radiation passing through the second prism to enter the coupling surface of the first prism and to be coupled by the first prism into the waveguide and to emit radiation traveling in the opposite direction, said angle α being determined by the indices n_p, n_ν and n_{eff} and by the prism angles γ' and β, wherein the angle

$$\alpha = \arcsin\left\{\sin(\gamma'-\beta)\sqrt{n_\nu^2 - n_p^2\sin^2\left(\gamma' - \arcsin\frac{n_{eff}}{n_p}\right)} - n_p\cos(\gamma'-\beta)\sin\left(\gamma' - \arcsin\frac{n_{eff}}{n_p}\right)\right\},$$

said angles γ' and β and the indices n_{eff}, n_p and n_ν in the temperature range ΔT being selected with the temperature responses for each of the indices n_{eff}, n_p and n_ν and with the indices n_p and n_ν compensating for the effect of temperature on the index of refraction n_{eff} of the waveguide so that the coupling angle α remains essentially constant.

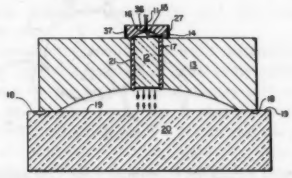
4,545,643
RETRO-REFLECTIVE ALIGNMENT TECHNIQUE FOR FIBER OPTICAL CONNECTORS

Christopher M. Young, and Steven J. Cowen, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 4, 1983, Ser. No. 491,504

Int. Cl.⁴ G02B 7/26

U.S. Cl. 350—96.20 **20 Claims**



1. An apparatus for providing an optically aligned connector for at least one optical fiber having an end receiving light from a source and it other end emanating the light comprising:

means for reflecting light having a flat reflective surface;

a connector plate having a flat abutting surface sized to fit on the flat reflective surface in laterally displaceable adjacent contact with the flat reflective surface and provided with a transverse hole orthogonally disposed with respect to the flat reflective surface irrespective of the lateral displacement thereof on the flat reflective surface;

means sized to fit and be secured within the hole for collimating light therethrough;

means operatively disposed with respect to the optical fiber and the connector plate for selectively relatively positioning the light emanating end of the optical fiber with respect to the means for collimating light;

means optically coupled to the optical fiber for indicating the magnitude of the light intensity reflected from the means for reflecting light, the means for indicating light intensity provides a maximum reading when the light emanating end of the optical fiber is optimally positioned by the means for selectively relatively positioning to maximize the intensity of the reflection of collimated light therethrough; and

means disposed adjacent the means for collimating light and the optical fiber for securing their relative disposition when the optical fiber is said optimally positioned other than movements of the means for selectively relatively positioning, the flat reflective surface and the flat abutting surface are the only mechanically precisioned surfaces of the apparatus.

4,545,644
OPTICAL FIBER CONNECTOR AND ARTICLES CONNECTED THEREWITH

George F. DeVeau, Jr., Stone Mountain, and Calvin M. Miller, Lilburn, both of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 538,966, Oct. 4, 1983, abandoned. This application Aug. 3, 1984, Ser. No. 637,344

Int. Cl.⁴ G02B 7/26

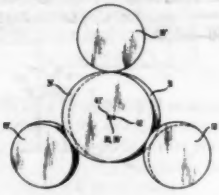
U.S. Cl. 350—96.21 **10 Claims**

1. Optical fiber connector comprising

(a) a first and a second substantially cylindrical body including a substantially axial bore, the first and second cylindri-

cal bodies to be referred to as the first and second capillary cylinders, respectively, each capillary cylinder to receive in its bore a stripped portion of an optical fiber comprising an end of the optical fiber, the fiber to be maintained fixedly in the bore of the capillary cylinder, each capillary cylinder having at least one free end face, so as to permit said end of the fiber to be substantially flush with the free end face of the capillary cylinder,

(b) first means for maintaining the first capillary cylinder in substantially fixed radial relation relative to the second capillary cylinder, with the free end faces in opposed position, and



(c) second means for maintaining the first capillary cylinder in substantially fixed axial relation relative to the second capillary cylinder, characterized in that

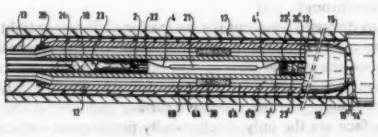
(d) the first means comprise a multiplicity of alignment rods, each rod having a radius, at least one of the rods including a "flat" extending from a first end of the rod for a substantial fraction of the length of the rod, a "flat" being a section of the rod having a radius of curvature larger than the radius of the rod, the difference between the radius of the rod and the minimum radial distance from the axis of the rod to the flat to be referred to as the "maximum offset", the alignment rods to be maintained in substantially fixed contacting relationship with the first and the second capillary cylinder.

4,545,645

CONNECTION JOINING THE ENDS OF TWO UNDER-WATER OPTICAL FIBER CABLES AND A METHOD OF MANUFACTURING SAME

Georges Mignien, Calais, France, assignor to Les Cables de Lyon, Clichy, France

Filed Apr. 6, 1983, Ser. No. 482,646
Claims priority, application France, Apr. 9, 1982, 82 06242
Int. Cl.[4] G02B *5/14*
U.S. Cl. 350—96.21 **12 Claims**



1. A connection joining the ends of two under-water optical fiber cables, each cable comprising an optical core constituted by a carrier wire covered by a helically grooved plastics rod having optical fibers received in its grooves; a protective tape wrapped about the optical core; a steel wire arch assembly covering said tape; a copper tube drawn down on the arch assembly; and an insulating sheath made of a thermoplastic substance about said copper tube; the improvement wherein the connection comprises:

a. plastics rods axially glued respectively to the ends of each cable carrier wire, the ends of the optical fibers being wound around said rods, said fibers being welded individually to each other and two tapes wrapped about said fibers on said rods for protecting said fibers;

b. a split plastics tube covering the tape surrounded optical fibers with its ends overlying said rods carrying said wound optical fibers;

c. a sheath covering said split plastics tube, the ends of each arch assembly being reconstituted around said sheath; and

d. a sleeve glued and/or crimped onto the ends of said arch assemblies and extending therebetween.

7. A method of manufacturing a connection joining the ends of two under-water optical fiber cables, each cable comprising an optical core constituted by a carrier wire covered by a helically grooved plastics rod having optical fibers received in its grooves; a protective tape wrapped about the optical core; a steel wire arch assembly covering said tape; a copper tube drawing on the arch assembly; and an insulating sheath made of a thermoplastic substance about said copper tube; said method comprising the steps of:

a. removing the insulating sheath and the drawn down copper tube from each cable end along a length very much greater than that required for said connection, untwisting the arch assembly, removing the grooved rod from each cable end along a length very much greater than that required for said connection, thereby leaving the optical fibers and the carrier wire bare;

b. engaging the sheath on a cable end;

c. placing a smooth rod on each cable end;

d. welding the optical fibers together one-to-one and winding them round the smooth rods on either side of their welds;

e. setting the resilient protective tapes in position on the optical fibers, about said rods and then setting a split tube in position on the tapes;

f. applying a tubular insulating sheath to the center of the connection with ends thereof covering ends of the split tubes, and then reforming each arch assembly over the sheath; and

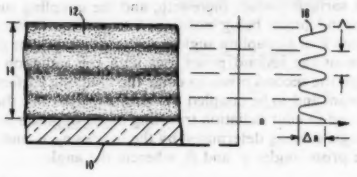
g. applying a sleeve to the center of the connection covering the ends of said arch assemblies and extending therebetween.

4,545,646

PROCESS FOR FORMING A GRADED INDEX OPTICAL MATERIAL AND STRUCTURES FORMED THEREBY

Mao-Jin Chern, Rancho Palos Verdes; Ronald T. Smith, Redondo Beach, and John W. Peters, Malibu, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 2, 1983, Ser. No. 528,833
Int. Cl.[4] G02B *5/18*; B05D *3/06*
U.S. Cl. 350—162.2 **22 Claims**



1. A process for depositing on the surface of a substrate a layer of a chosen material in which the index of refraction of said layer varies in a predetermined continuous and periodic pattern as a function of the thickness of said layer, comprising the steps of:

(a) providing said substrate;

(b) providing first and second selected vapor phase reactants which react upon inducement by radiation of a selected wavelength to form said chosen material which deposits on said substrate;

(c) exposing said substrate to said first and second vapor phase reactants in predetermined proportions in the presence of said radiation to deposit said chosen material

having a first predetermined stoichiometric composition and a first predetermined index of refraction;

(d) altering said predetermined proportions of said first and second vapor phase reactants as a function of time in a continuous manner to correspondingly alter in a continuous manner said stoichiometric composition and said index of refraction of said chosen material deposited as a function of time and to thereby produce said graded index of refraction in said chosen material; and

(e) repeating said altering of step "d" for the number of times required to produce said variation of said refractive index in said predetermined continuous and periodic pattern as a function of said thickness of said layer.

17. An article of manufacture comprising:

(a) a selected substrate; and

(b) a layer of a chosen material deposited on the surface of said substrate to a thickness having a predetermined profile wherein the stoichiometric composition of said layer as deposited varies in a first predetermined periodic and continuous pattern as a function of thickness and in a second predetermined pattern across the horizontal said surface of said substrate to produce successive gradations in said index of refraction in said first and second predetermined patterns as a function of said thickness and as a function of the lateral position on said horizontal surface of said substrate.

4,545,647

RESILIENT INTERCONNECTION FOR EXCHANGEABLE LIQUID CRYSTAL PANEL

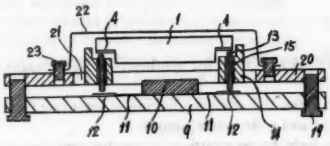
Takehiko Sasaki, Yamatokoriyama, and Tamotsu Koyama, Kashiwara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 379,002, May 17, 1982, abandoned, which is a continuation of Ser. No. 940,388, Sep. 7, 1978, abandoned, which is a continuation of Ser. No. 619,974, Sep. 30, 1975, abandoned. This application Aug. 5, 1983, Ser. No. 520,224

Claims priority, application Japan, Sep. 30, 1974, 113142

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—331 R **3 Claims**



1. A display assembly comprising:

a liquid crystal display cell having first and second planar substrates having a liquid crystal material disposed therebetween and a plurality of display electrodes having input electrodes connected thereto, uniformly spaced apart and coplanarly arranged;

a support;

drive means provided on said support for applying signals to said liquid crystal display cell, said drive means having coplanarly arranged output electrodes which subtend corresponding said input electrodes;

compressible resilient interconnection means for interconnecting said output electrodes with said corresponding input electrodes, said interconnection means including:

a multiplicity of compressible, resilient conductive rods extending from said output electrodes to said corresponding input electrodes; and

a compressible, resilient non-conductive medium interposed between and enveloping adjacent conductive rods in the provision of an elongated configuration having a length and a rectangular cross section with a height dimension bridging said input and output electrodes substantially greater than a width dimension orthogonal thereto, said medium extending along said height dimension between said output electrodes and said corresponding input electrodes;

said elongated configuration having a first surface exposing first ends of said multiplicity of compressible resilient conductive rods to said input electrodes on said liquid crystal display cell and a second surface exposing the opposite ends of said multiplicity of compressible conductive rods to corresponding ones of said output electrodes of said drive means;

said compressible conductive rods each having a cross-sectional width which is selected narrower than the distance provided between adjacent electrodes on the liquid crystal display cell and circuit board and being randomly disposed throughout said non-conductive medium; and

said non-conductive medium having a distance between adjacent said rods less than or equal to the width of the electrodes on the liquid crystal display cell and drive means, but greater than zero to thereby assure non-interfering conducting paths between said output electrodes and said corresponding input electrodes;

housing means provided on said support for constraining said liquid crystal display cell to inhibit movement thereof in the plane of said display substrates so that said input electrodes are subtended by said output electrodes, said housing means further including a support extending on both sides of the width dimension of said medium, said support defining a slot for receiving said compressible, resilient interconnection means and inhibiting the movement thereof in the plane of said display substrates, said slot being at least the length of said medium; and

cover means affixed to said support for covering said display cell to compress said compressible resilient interconnection means to ensure positive contact between said output electrodes and said corresponding input electrodes.

4,545,648

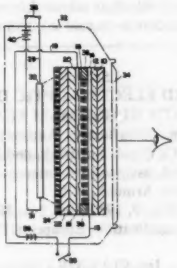
NACREOUS TRANSFLECTOR ILLUMINATION SYSTEM FOR LIQUID CRYSTAL DISPLAY

Joseph Shulman, Hyde Park, and David L. Clifford, Sherborn, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 30, 1980, Ser. No. 202,374

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—337 **11 Claims**



5. A transflector element comprising a layer of nacreous pigment material coated onto one surface of a light polarizer.

4,545,649

ELECTRO-OPTICAL DISPLAY DEVICE OF POINT MATRIX TYPE

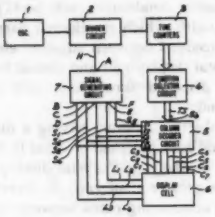
Fereydoun Gharadjedaghi, Neuchâtel, and Jean-Francois Guyenet, Montmollin, both of Switzerland, assignors to Asulab S.A. - ETA 72, Bienne, Switzerland

Filed Jan. 28, 1982, Ser. No. 343,452

Claims priority, application Switzerland, Feb. 9, 1981, 828/81

Int. Cl.⁴ G02F *1/133*

U.S. Cl. 350—356 **5 Claims**



1. An electro-optical display device comprising:

(a) a display cell comprising a layer of material which is capable of responding to the application of an electrical field by a modification of its optical behaviour,

(b) means for applying said electrical field to said layer at each point of a matrix of points arranged in lines and columns comprising a first system of mutually insulated electrodes applied on a first face of said layer for defining said lines of points and a second system of mutually insulated electrodes applied on the second face of said layer for defining said columns of points and arranged in several groups comprising each a first and a second electrode, said first electrode in one of said groups comprising a series of first elementary conducting areas electrically connected to each other and spaced from each other, said second electrode in said one of said groups comprising a series of second elementary conducting areas electrically connected to each other and disposed between said first elementary conducting areas, and at least a portion of one of said first elementary conducting areas and at least a portion of the second elementary conducting area adjacent to said portion of said one of said first elementary conducting area being both disposed in a facing relationship with one and the same electrode of said first system of electrodes, and

(c) a control device comprising means for producing at least n+1 different electrical signals, n being the number of electrodes of said first system, means for applying each of the first n signal to a respective electrode of said first system and means responsive to a display control signal for applying to each electrode of said second system a respective signal which is selected from said at least n+1 signals in dependence on said control signal.

4,545,650

LIQUID FILLED ELECTRO-OPTIC DISPLAY CELL WITH DIAPHRAGM SEAL

David H. Kirkman, Winchester; Anthony C. Lowe, North Baddesley; John C. Wood, Eastleigh, and Ian Golledge, Romsey, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1983, Ser. No. 560,049

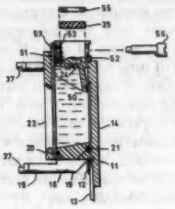
Claims priority, application European Pat. Off., Dec. 30, 1982, 82306990.1

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 350—357 **8 Claims**

1. A liquid filled electro-optic display cell having: an enclosure for the liquid; a filling orifice in one of the walls of the enclosure, said orifice being surrounded by a rim which is raised; an impervious elastomer diaphragm in contact with said rim so as to seal the orifice;

and a retaining means for retaining said diaphragm in



contact with said rim while allowing it freedom to flex over a central portion of said orifice thereby to accommodate differential thermal expansion of the liquid and enclosure.

4,545,651

OPTICAL SYSTEM FOR SYNTHESIZING PLURAL LIGHT BEAMS

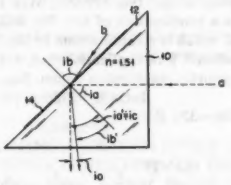
Kiichi Kato, and Masaharu Sakamoto, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,869

Claims priority, application Japan, Jan. 11, 1982, 57-2495

Int. Cl.⁴ G02B *5/30, 27/10*

U.S. Cl. 350—394 **11 Claims**



1. An optical system for synthesizing light beams, comprising:

a light refractive member having at least one face, a critical angle and a Brewster's angle;

first light beam emitting means for emitting a first light beam of parallel light rays and permitting the first parallel light beam to pass through the light refractive member so that the light beam is applied to the face of the light refractive member at an angle of incidence equal to at least the critical angle, the first parallel light beam being totally reflected by the face of the light refractive member and transmitted in a specified direction;

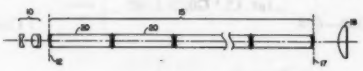
second light beam emitting means for emitting a second light beam of parallel light rays to the face at an angle of incidence substantially equal to the Brewster's angle, the second parallel light beam being refracted by the light refractive member at an angle of refraction substantially equal to the Brewster's angle as viewed from the refractive side of the light refractive member and transmitted in a direction which defines a predetermined angular difference with respect to the specified direction of the reflected first parallel light beam and;

reflection preventing means formed on the face of the light refractive member for allowing the angle of refraction of the second parallel light beam to approach the critical angle, so as to reduce said predetermined angular difference from that obtained in the absence of said reflection preventing means.

4,545,652
FLAT FIELD LENSES

Jan Hoogland, 41 Los Charros La., Portola Valley, Calif. 94025

Filed May 29, 1981, Ser. No. 268,230
Int. Cl.[4] G02B *23/00*
U.S. Cl. 350—432 34 Claims



1. A lens assembly for incorporation into an optical transfer system wherein four such assemblies define an optical transfer module for transferring an image between successive image planes, comprising:

a positive element constructed of a first material having a relatively high index of refraction; and

a negative element cemented to said positive element and being constructed of a second material having a relatively low index of refraction;

said positive and negative elements being characterized by surface radii and refractive indices chosen to define at least one curved interface and a significant index difference across said interface;

the assembly being configured so that when four such assemblies are aligned to define the transfer module, two of the assemblies have their respective curved interfaces proximate respective ones of the successive image planes while the remaining two have their respective curved interfaces proximate an intermediate plane halfway between the image planes;

the surface radii and refractive indices of said positive and negative elements being chosen so that the normalized Petzval sum of the transfer module is significantly less than the inverse of the refractive index of said first material, with the difference between said inverse and the Petzval sum being equal to the sum of bonding, spacing, and index difference contributions;

the index difference contribution to the Petzval sum correction being at least two-thirds the sum of the bending, spacing, and index difference contributions;

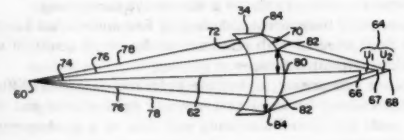
the dispersion of said first and second materials being chosen to substantially correct chromatic aberration;

at least one of said elements including portions defining an outer aspheric surface to correct spherical aberration.

4,545,653
FOCUSING ELEMENTS AND SYSTEM FOR PRODUCING A PRESCRIBED ENERGY DISTRIBUTION ALONG AN AXIAL FOCAL ZONE

Bryon B. Brenden, Richland, Wash., and James T. Russell, Salt Lake City, Utah, assignors to Digital Recording Corporation, Salt Lake City, Utah

Division of Ser. No. 223,229, Jan. 7, 1981, Pat. No. 4,426,696. This application Oct. 14, 1983, Ser. No. 542,132
Int. Cl.[4] G02B *13/18*
U.S. Cl. 350—432 17 Claims

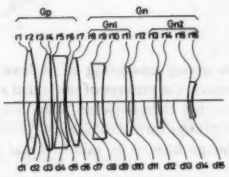


1. An axicon focusing element comprising a nonconical, aspheric focusing medium defining a figure of revolution about an axis for producing a predetermined output intensity distribution of energy between two different points U_1 and U_2 along said axis when said axicon focusing element is irradiated by a source of energy directed along said axis, said source producing an axially symmetric input intensity distribution of said energy and said figure of revolution being defined in accordance with a radially continuous, curved function of said input and output intensity distributions.

4,545,654
BRIGHT TELEPHOTO LENS

Shigetada Sato, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 425,582, Sep. 28, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,798
Claims priority, application Japan, Nov. 11, 1981, 56-180883
Int. Cl.[4] G02B *13/02*
U.S. Cl. 350—454 8 Claims



1. A telephoto lens having a convergent lens group on the object side and a divergent lens group on the image side, wherein said convergent lens group is composed in combination of first, second and third positive lenses and a single negative lens, said first positive lens being closest to the object and made of an optical material having a partial dispersion ratio in the range of from 1.22 to 1.29 with respect to g-line and d-line but made of optical material of other than anomalous dispersion, said negative lens being disposed more closely to the image than said first positive lens, said second and third positive lenses being disposed more closely toward the image than said first positive lens and made of an optical material of anomalous dispersion having a partial dispersion ratio θ in the range of from 1.22 to 1.24 with respect to g-line and d-line and having an Abbe number ν_d which ranges from 80 to 95.5, said telephoto lens satisfying the following relations:

$$0.20 < \frac{\psi_1}{\psi_2 + \psi_3} < 0.55 \quad (1)$$

$$23.5 < \nu_{dn} < 55.0 \quad (2)$$

$$0.4 < \frac{|\psi_n|}{\psi_p} < 0.9 \quad (3)$$

where ψ_1, ψ_2, ψ_3 are the refractive powers of the first, second and third positive lenses, respectively, ν_{dn} is the Abbe number of the negative lens, ψ_p is the sum of the surface refractive powers of the three positive lenses on their image sides, and ψ_n is the surface refractive power of the negative lens on the image side, with $\psi_n < 0$.

4,545,655
OPTICAL VIEWING SYSTEM

Stephen D. Fantone, Saugus, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 2, 1984, Ser. No. 596,010
Int. Cl.[4] G02B *23/08, 23/14, 9/34;* G03B *13/02*
U.S. Cl. 350—540 16 Claims

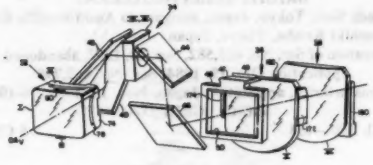
1. An optical system arranged along an optical axis, said optical system comprising, from object to image space:

a first lens group consisting of at least one element of negative power including at least one aspheric surface;

a second lens group consisting of at least one element of

positive power, the powers of said first and second groups, and the spacing therebetween being such that said groups in combination are convergent, forming a real image in a predetermined plane located behind said second group;

a third lens group consisting of at least one element of positive power; and



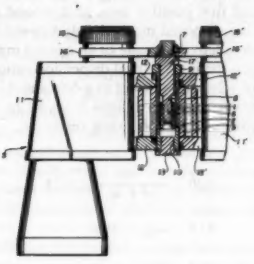
a fourth lens group consisting of at least one element of positive power, the powers of said third and fourth groups and the spacing therebetween being such that said third and fourth groups form a substantially collimated image of said real image formed by said first and second groups.

4,545,656

FOCUS ADJUSTING DEVICE FOR BINOCULAR

Katuto Takano, Hatogaya, Japan, assignor to Toei Optical Industries Co. Ltd., Saitama, Japan

Filed Sep. 16, 1983, Ser. No. 532,908
Int. Cl.[4] G02B *7/04, 23/00*
U.S. Cl. 350—552 **4 Claims**



1. A focus adjusting device for a binocular, comprising

(a) a cylindrical tubular center shaft member for supporting right and left body tubes, said center shaft member containing a horizontal through slot in its lower portion;

(b) a cylindrical tubular lever cam member arranged within said center shaft member, said lever cam member including a screw thread portion on its inner cylindrical surface and containing a through hole in its lower portion, which through hole is aligned with the through slot contained in said center shaft member;

(c) an adjusting knob surrounding said center shaft member and including a set screw aligned with and extending through the through slot and through hole to interlockingly connect said adjusting knob with said lever cam member; and

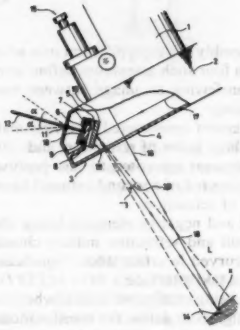
(d) a lever shaft member for supporting eyepiece lens cylinders, the lower portion of which lever shaft member extends within said center shaft member, said lever shaft including on its lower surface a screw thread portion screw-threaded to the screw thread portion of said lever cam member.

4,545,657

LASER BEAM SCANNING MIRROR FINELY ADJUSTED VIA JOYSTICK

Katsuyoshi Sunago, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 8, 1982, Ser. No. 396,205
Claims priority, application Japan, Jul. 10, 1981, 56-108616
Int. Cl.[4] G02B *5/08*
U.S. Cl. 350—600 **7 Claims**



1. A laser beam scanning adjustment mechanism in which the movement of a joystick is transformed into the inclination of a mirror, comprising;

a movable mirror holder for holding a mirror, said mirror holder having a concave surface with a first point substantially at the center of said concave surface, pivot bearing means positioned between said mirror holder and said mirror at a second point aligned with said first point of said center of said concave surface, said pivot bearing means serving as a fulcrum for movement of said mirror holder; and

a joystick having one end in contact with said concave surface of said mirror holder for varying the inclination of said mirror as a result of joystick movement in contact with said concave surface which in turn moves said mirror holder.

4,545,658

VISUAL EXAMINATION APPARATUS

Joseph F. Weiss, 8425 Countrywood Fairway, Cordova, Tenn. 38018

Filed Feb. 22, 1983, Ser. No. 468,067
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—222 **4 Claims**

1. Visual examination apparatus for administering the photostress recovery test to a human eye comprising:

a movable transparent slide having first and second Landalt rings selected with reference to the visual acuity of said eye imprinted thereon;

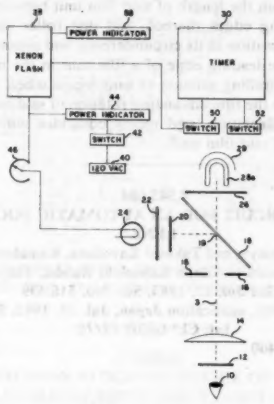
means comprising a variable light source and a diffuser positioned between said variable light source and said slide for retro-illuminating said slide to a predetermined level;

means comprising a lens and a beam splitter positioned relative to the visual axis of said eye to focus the view of said eye upon one of the Landalt rings;

means aligned with the visual axis of said eye for repeatedly producing and directing a brilliant flash of light having a

spectral distribution including blue, green and red for bleaching the foveal cones of said eye;

a timer; and



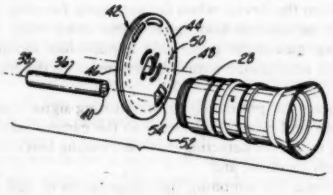
switch means for simultaneously triggering said flash means and starting said timer and for stopping and resetting said timer.

4,545,659

DEVICE FOR CONTINUOUSLY VARYING THE SHUTTER SPEED OF A VIDEO TAPE CAMERA

Steven L. Swinehart, and Werner H. Kuhn, both of Albuquerque, N. Mex., assignors to Nisus Video Incorporated, Albuquerque, N. Mex.

Filed Dec. 16, 1983, Ser. No. 562,234
Int. Cl.[4] G03B *9/10*
U.S. Cl. 352—216 **32 Claims**



1. A focal plane shutter for a video camera having a lense and pickup comprising:

first disk means disposed between said lense and said pickup for rotation about an axis, said first disk means defining an annular locus in registration with said pickup and having a first opening intersecting said locus;

second disk means disposed between said lense and said pickup for rotation about said axis, said second disk means having a second opening in registration with said locus;

said first and second openings being registrable to define a light admitting aperture between said lense and said pickup;

said first disk means including means for substantially balancing said first disk means as it rotates;

means for rotating said first and second disk means; and

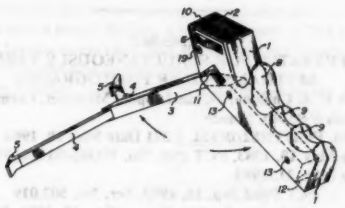
means for adjusting the relative angular positions of said first and second disk means while said disk means are rotating to thereby adjust the size of said light admitting aperture.

4,545,660

CAMERA HANDLE WITH RETRACTABLE BIPOD SUPPORT

Alain Rudolf, 12 Rue Vivienne, Paris 2ème, France (75002)

Filed May 10, 1984, Ser. No. 609,278
Claims priority, application France, May 27, 1983, 83 08782
Int. Cl.[4] G03B *17/00*
U.S. Cl. 354—82 **8 Claims**



1. Handle apparatus adapted to be attached to a camera comprising:

a handle body having a channel,

a tube pivotably connected to said handle body for movement into and out of said channel,

means between said handle body and tube for locking said tube in an adjusted pivoted position relative to said handle body, and

a pair of relatively pivotable legs normally retractably housed within said tube, but slidable in telescoping relation to said tube to a use position exterior of said tube wherein they can be used as a bipod support,

spring means connecting one end of each of said legs and biasing said legs away from each other to spread said legs as said legs are removed from said tube, and

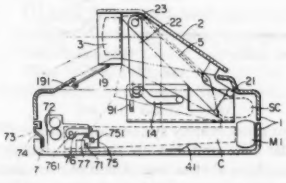
pin means across the bottom of said tube for limiting removal of said legs from said tube and in combination with said spring means causing each of said legs to wedge between said pin means and the bottom of said tube when said legs are fully removed thereupon.

4,545,661

FOLDING CAMERA WITH MOVABLE MEMBER MOUNTING AN OBJECTIVE LENS AND REFLEX MIRROR

Takehiko Hamaguchi; Kiyoaki Hazama; Kenichi Iwaida, all of Hachioji, and Takeyoshi Iguchi, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 5, 1983, Ser. No. 492,493
Claims priority, application Japan, May 19, 1982, 57-85586
Int. Cl.[4] G03B *17/04, 17/52, 19/12*
U.S. Cl. 354—86 **8 Claims**



1. In a folding camera of the type having a base housing for holding a film cassette containing a plurality of film sheets, means for exposing a film sheet to light received from a subject by an objective lens and reflected from a reflex mirror to the film sheet at an exposure position in the base housing, and means for developing the film sheet and advancing it from an exit end of the base housing, the improvement wherein said

means for exposing comprises a movable member supporting said objective lens and reflex mirror which is movable between a closed position forming a closure to the base housing and an open position in which said movable member is elevated above said base housing, said objective lens being rididly fixed to said movable member at a distal end thereof in an operative position for exposure, and a supporting member connected to the other end of said movable member and being pivotally coupled to said base housing at an end thereof opposite from the film exit end.

4,545,662

APPARATUS FOR SIMULTANEOUSLY TAKING SEVERAL SIMILAR PHOTOGRAPHS

Camille V. A. Chalono, 28, rue Léopold Mourrier, Cormeilles en Parisis-F-95240, France

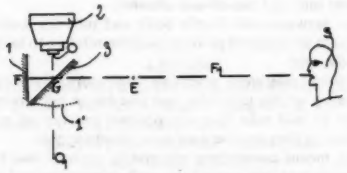
PCT No. PCT/FR82/00151, § 371 Date May 18, 1983, § 102(e) Date May 18, 1983, PCT Pub. No. WO83/01124, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 16, 1982, Ser. No. 502,019

Claims priority, application France, Sep. 18, 1981, 81 17614

Int. Cl.⁴ G03B *41/00*

U.S. Cl. 354—118 **5 Claims**



1. A camera apparatus comprising a camera having a shutter and a lens which permits taking of a plurality of identical contiguous photographs of a desired subject for each shutter release, an optical system in optical alignment with said camera adapted to form N distinct virtual images of a same object in front of said lens of said camera, said optical system comprising in combination N mirrors and a partially transparent mirror positioned relative to each other on an optical axis.

4,545,663

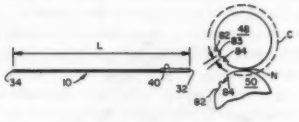
INTEGRAL SELF-DEVELOPING FILM UNIT AND SYSTEM FOR USE THEREOF

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 453,700, Dec. 27, 1982, abandoned. This application Jun. 20, 1983, Ser. No. 506,109

Int. Cl.⁴ G03D *9/02*

U.S. Cl. 354—304 **23 Claims**



1. An instant photography system comprising:

a rectangular film unit having leaving, trailing and side edges, the physical structure of said unit consisting essentially of a pair of superposed sheets sandwiching a photochemical composition, a processing fluid pod located along the leading edge of the unit, a processing fluid trap defined exclusively by portions of said sheets along the trailing edge of the unit, and means for securing together to form said unit said sheets and said pod; and

processing means for rupturing said pod and spreading said processing fluid throughout the area between said sheets, said processing means comprising a pair of rollers supported to establish a predetermined spacing gap at said nip, the cylindrical surface of at least one of said rollers being of a circumference approximately equal to or greater than the length of said film unit between leading and trailing edges thereof, said one roller including a recess formation in its circumference and means for positioning the leading edge of a film unit in the nip of said rollers in trailing relation to said recess when viewed in relation to the film advancing rotation of said rollers such that upon rotation, said recess coincides with the trap portion of said film unit.

4,545,664

SIGNAL CIRCUIT FOR AN AUTOMATIC FOCUSING LENS

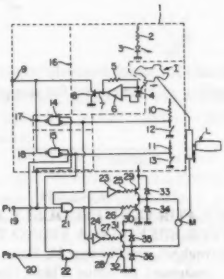
Shinji Sakai, Tokyo, and Takashi Kawabata, Kamakura, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,439

Claims priority, application Japan, Jul. 28, 1982, 57-130394

Int. Cl.⁴ G03B *13/18*

U.S. Cl. 354—400 **8 Claims**



5. A signal circuit for an automatic focusing lens attachable to a camera having a focus-detection device, and adapted to move a focusing lens to a focusing position in accordance with an output from the device when the automatic focusing lens is mounted on the camera, said signal circuit comprising:

monitoring means for generating a pulse-like monitoring signal in accordance with the movement of the focusing lens;

output means for presenting the monitoring signal transmitted from said monitoring means to the camera side;

detecting means for detecting that the focusing lens is moved to a limit location; and

control means for inhibiting the transmission of said monitoring signal to said output means when said detecting means detects that the focusing lens is moved to the limit location, thereby to make the transmission of a limit signal to said output means possible.

4,545,665

FOCUS DETECTING DEVICE

Yoshihiko Aihara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 590,064

Claims priority, application Japan, Mar. 23, 1983, 58-48511

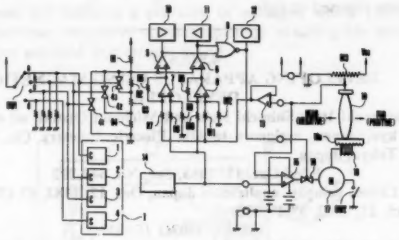
Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—402 **6 Claims**

1. A focus detecting device for a camera having a plurality of different kinds of automatic exposure determining modes, comprising:

(a) a focus state detection circuit for detecting a focused state, said circuit being arranged for judging whether or not said focus state has come into an in-focus state;

(b) an adjusting circuit for adjusting the judging accuracy of said focus state detection circuit by judging whether or or



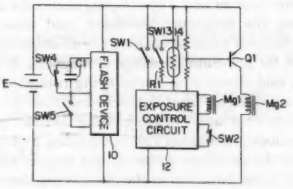
not said in-focus state is attained according to each mode selected from the plurality of exposure determining modes.

4,545,666

LIGHT EMISSION BLOCKING DEVICE OF A CAMERA CAPABLE OF EFFECTING FLASHLIGHT PHOTOGRAPHY

Hiroshi Wakabayashi, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,639
Claims priority, application Japan, Nov. 18, 1982, 57-202441
Int. Cl.⁴ G03B *15/05*
U.S. Cl. 354—412 **9 Claims**



6. A camera provided with a camera housing, a flash unit provided in said housing, and a projecting device for causing the light-emitting portion of said flash unit to project outwardly of said housing and thereby enable light emission, and using a roll film, said camera comprising:

release means operable by an operator for photographing of an object to be photographed;

driving means for detecting the deficiency of the brightness of said object for photography and operating said projecting device to cause said light-emitting portion to project;

means for advancing said roll film in said camera housing in response to said release means; and

means for blocking the operation of said driving means until a portion corresponding to the first frame of said roll film to be exposed during the first photography effected using said roll film loaded in said camera housing is disposed at a predetermined position in said camera housing.

4,545,667

CAMERA WITH AUTOMATIC STROBE

Katsuhisa Niwa, and Takahiro Ikeda, both of Osaka, Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Oct. 25, 1983, Ser. No. 545,280
Claims priority, application Japan, Oct. 25, 1982, 57-186942
Int. Cl.⁴ G03B *15/05*
U.S. Cl. 354—419 **4 Claims**

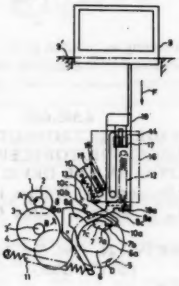
1. A camera with automatic strobe having a strobe part which is automatically driven between a ready position where the strobe part is protruded out of a camera body for a flashing and a restored position where the strobe part is restored in the camera body when it is not used, comprising:

a first energizing member for driving said strobe part in a direction to protrude out of a camera body,

a second energizing member for driving said strobe part to restore into said camera body surpassing a force of said first energizing member,

a driving lever fulcrumed on said camera body in a manner that a first part thereof being energized in a predetermined direction by said second energizing member and a second part thereof being abutting a receiving part of said strobe part thereby to energize said strobe part in a direction to restore it into said camera body,

an electric motor rotating in a predetermined rotary direction,



a cam which is to be rotated by said electric motor, thereby to drive said driving lever against said energizing force of said second energizing member, to allow a restoration of said strobe part into said camera body by the force of said second energizing member at a first predetermined rotary phase of said cam, and to allow a protrusion of said first energizing member at a second predetermined rotary phase period of said cam,

a reversing-prohibition means which prohibit reversing rotation of said cam when said strobe part reaches said protruded position,

a lever stopping means which prohibit motion of said lever in a direction opposite to said predetermined direction when said strobe part is in said restored position, and

a motor drive control circuit for actuating said motor responding to plural input signals of photographic condition.

4,545,668

IMAGE FORMING APPARATUS

Hirohachi Zaitsu, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 6, 1983, Ser. No. 529,744
Claims priority, application Japan, Sep. 6, 1982, 57-154807
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—3 R **8 Claims**

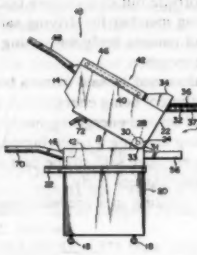
1. An image forming apparatus, comprising:

a main body having a first unit and a second unit which are separable from each other;

connecting means for connecting the first and second units to each other in such a way that the first unit is swingable by a predetermined angle in relation to the second unit; and

disposing means having a disposing face on which sheets to be fed to the first unit are disposed, attached to the first unit, and said disposing face is slanted by an elevation

angle equal to or larger than said predetermined angle, and in a direction which is the reverse of that in which the



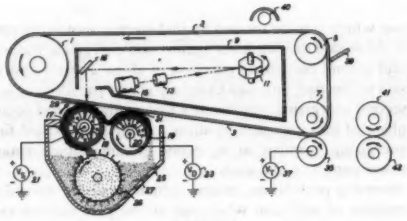
first unit is swung in relation to the second unit, when the first unit is closed to the second unit.

4,545,669

LOW VOLTAGE ELECTROPHOTOGRAPHY WITH SIMULTANEOUS PHOTORECEPTOR CHARGING, EXPOSURE AND DEVELOPMENT

Dan A. Hays, Fairport, and William H. Wayman, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1984, Ser. No. 582,108
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **31 Claims**



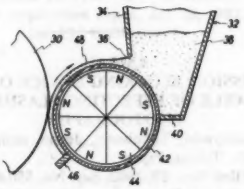
1. An apparatus for simultaneously charging, exposing, and developing imaging members at low voltages comprised of a semi-transparent deflected flexible imaging member, an electronic imaging source means, a light beam deflector member, a modulator means, a laser means, a sensitizing roll means, containing magnets therein, a development roll means with magnets therein, a voltage source means for the sensitizing roll means, a voltage source means for the development roll means, a developer supply reservoir containing conductive developer particles therein comprised of insulating toner resin particles and conductive carrier particles, a sensitizing nip situated between the flexible imaging member and the sensitizing roll, a development nip situated between the imaging member and the development roller, the sensitizing roll means and development roll means moving in the same direction of movement as the semi-transparent deflected flexible imaging member, the voltage being generated by the voltage source for the sensitizing nip being of an opposite polarity of the voltage generated by the voltage source for the development roller, wherein an electric field of a predetermined polarity is established between the semi-transparent deflected flexible imaging member and the sensitizing roll means, which field exerts in the sensitizing nip an electrostatic force on the charged toner particles causing these particles to uniformly migrate toward the imaging member, subsequently subjecting the deflected flexible imaging member to the electronic image source whereby the electrostatic force exerted on the toner particles adjacent the light struck areas of the flexible imaging member are increased, thereby causing toner particles to be deposited on the deflected flexible imaging member, and wherein toner particles are removed from the deflected flexible imaging member in areas not exposed to light by the development roll, and developed in the areas exposed to light.

4,545,670

DEVELOPING APPARATUS USING MAGNETIC DEVELOPER

Katsuyuki Itoh; Shinichi Itoh, and Michiaki Otsuki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,292
Claims priority, application Japan, Oct. 12, 1982, 57-177581; Oct. 12, 1982, 57-177582
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DD **8 Claims**



1. A developing apparatus using a magnetic developer comprising a toner hopper for magnetic developer, said toner hopper having a single opening formed between one side plate of the toner hopper and a developing sleeve for delivering and recovering the magnetic developer, said toner hopper also having a bottom plate having a top end abutting the developing sleeve for preventing leakage of magnetic developer therebetween, said developing sleeve being rotatable in a direction toward said opening from a developing zone for developing a latent image on a latent image-bearing member with said magnetic developer, a magnet roll comprising a plurality of magnets inside the developing sleeve, said magnet roll being rotatable in the same direction as the developing sleeve, first motor means for adjustably controlling rotation of the developing sleeve, second motor means for adjusting and controlling rotation of the magnet roll, and a stopper means having a top end abutting or close to the surface of the developing sleeve in the direction of the axis of rotation of said developing sleeve for turning back flow of magnetic developer and preventing leakage of magnetic developer therebetween, wherein rotational speed of the developing sleeve and magnet roll are adjusted by the first and second motor means so that magnetic developer is distributed between the stopper and the hopper opening on a surface of the developing sleeve.

4,545,671

APPARATUS FOR GUIDING AND COOLING A HEATED IMAGE-CARRYING SUPPORT

Clifford L. Anderson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 2, 1983, Ser. No. 557,698
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 SH **4 Claims**

1. Apparatus for guiding and cooling a heated copy sheet as it is moved along a path which extends from a fuser, said apparatus comprising:

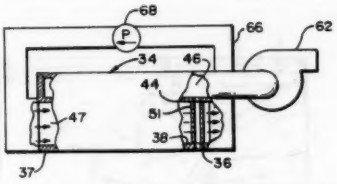
a housing which includes a heat-conductive guide member having a guide surface located adjacent to said path and a surface remote from said guide surface, said guide member having a plurality of vacuum openings at said guide surface;

a separator member within said housing for partitioning said housing into at least first and second chambers, said sec-

ond chamber being bounded on one side by said guide member;

means for producing a first flow of fluid through said second chamber to cool said guide member;

means for defining a plurality of passages which extend between respective vacuum openings in said guide member and said first chamber; and



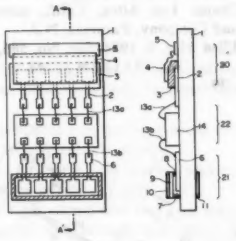
vacuum means for producing a second flow of fluid in said first chamber and in said passages to draw a heated copy sheet into contact with said guide surface as it is moved along said path, said second flow of fluid being separate from and independent of said first flow of fluid.

4,545,672

READING, PRINTING AND COPYING DEVICE

Takashi Ozawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Japan

Filed Nov. 3, 1983, Ser. No. 548,489
Claims priority, application Japan, Dec. 22, 1982, 57-225396
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **12 Claims**



1. A reading, printing and copy device, comprising:

image sensor means for receiving a predetermined potential and a light beam reflected from an original during a first predetermined control period of time, to hold or release said potential according to contents of said original;

memory means for storing, upon reception of a memory instruction, the state of said potential of said image sensor means for a second control period of time following said first control period of time;

shutter means for transmitting or interrupting the transmission of a copying light beam according to a input signal;

orignal reading signal output means for outputting an original reading signal; and

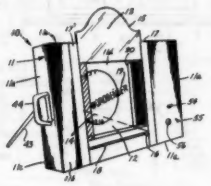
photo-sensitive copying means for reproducing said original by utilizing the operation of said shutter means so that said copying light beam is transmitted or interrupted.

4,545,673

PHOTOGRAPHIC MODIFIER METHOD AND APPARATUS FOR GRAPHICS AND THE LIKE

Calvin D. Bergsma, 1134 Baldwin Ave., Jenison, Mich. 49428

Filed Jul. 8, 1983, Ser. No. 512,402
Int. Cl.[4] G03B *27/68*
U.S. Cl. 355—52 **20 Claims**



1. A photographic modifier for photographically modifying images such as graphics and the like, comprising:

a stationary transparent support surface for supporting an image;

a movable support surface overlaying on one side of said stationary support surface for supporting photosensitive material;

a light housing on the other side of said stationary supporting surface, with a light therein and means for producing a narrow, thin highly directional elongated beam of light and directing said beam toward said two support surfaces;

motive power means for moving said beam of light across said stationary and movable support surfaces for progressively projecting a narrow, thin blade of light on said image and the photosensitive material behind it as said light sweeps across said image thereby exposing said pohntosensitive material as determined by said image; and

means for moving said movable surface simultaneously with said beam of light to create a modification of said image on said photosensitive material.

4,545,674

ORIGINAL PLACING STAND DEVICE

Yoshiyuki Ishitate, and Toshikatsu Takahashi, both of Kanagawa, Japan, assignors to Fuji Xerox Company, Limited, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 359,010
Claims priority, application Japan, Mar. 19, 1981, 56-38716
Int. Cl.[4] G03B *27/62*
U.S. Cl. 355—75 **2 Claims**

1. A copying machine for enlarging and copying microfilm comprising:

a rectangular frame for holding said microfilm;

a sheet roll onto which a copy of said microfilm is produced, said sheet roll being cut to produce individual sheets;

a placing stand device including a rotary plate for rotatably holding said microfilm in a plane parallel with a surface of said microfilm;

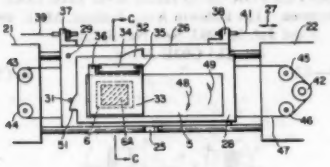
means for rotating said rotary plate comprising motor means, transmission means including at least one pulley and means for limiting the extent of rotation of said rotary plate; and

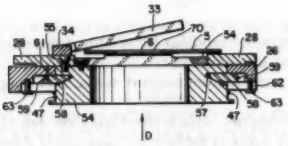
means for scanning an image recorded on said microfilm along either a short or long side of said frame so that two different sized copies can be produced selectively;

said rotary plate including shaft means for receiving torque from said motor means via said transmission means and friction means between said shaft means and a stationary member for increasing the force required to rotate said rotary plate;

said friction means comprising a plurality of wedges, spring means for biasing said wedges into an annular groove in

said shaft means, a plurality of pins insertable into said wedges and connectable to a non-rotatable member, and





an annular retaining cover for retaining said wedges in said annular groove.

4,545,675

TRANSPORT DEVICE FOR DISK SHAPED PRINT MASTERS

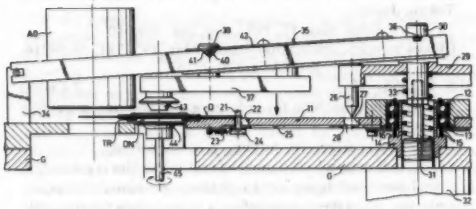
René Lüscher, Regensdorf, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Feb. 21, 1984, Ser. No. 581,531

Claims priority, application Switzerland, Mar. 10, 1983, 1288/83

Int. Cl.⁴ G03B *27/62, 27/64*

U.S. Cl. 355—76 **12 Claims**



1. A device for the transport of disk-shaped print masters having peripheral notches through a series of processing stations, comprising:

a carrousel that is rotatably driven in a step-wise manner;

a plurality of support elements for the print master disks distributed over the circumference of said carrousel;

a radially adjustable locking pin associated with each support element, said locking pin engaging in its radially outer normal position, a peripheral notch of a master disk in the support element and being out of engagement with said notches in its radially inner position, and

means for moving the locking pins associated with support elements located in selected processing stations from the normal outer position to the inner position.

4,545,676

CONTROLLING APPARATUS FOR PAPER-FEEDING DRIVE OPERATED BY DRIVING SYSTEM OF OPTICS UNIT FOR EXPOSURE

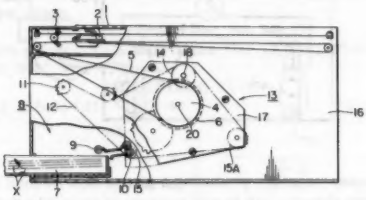
Shogo Kato, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 527,169

Claims priority, application Japan, Aug. 27, 1982, 57-148757

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—3 SH **9 Claims**



1. In a photocopying machine having an optical system for scanning a document to be copied, said system including a reciprocating portion capable of forward movement for scanning said document and reverse movement for recovery, said movements being produced by corresponding forward and reverse rotation of a drum, a paper-feeding drive comprising a controlling cam adopted to rotate with said drum and controlling the driving of a paper-feeding roller to feed recording paper, the improvement which comprises a controlling apparatus for said paper-feeding drive wherein rotation of said paper-feeding roller is suspended during at least a part of said reverse movement of said reciprocating portion, a sheet of paper being fed from a supply thereof to said paper-feeding drive while said rotation of said roller is suspended.

4,545,677

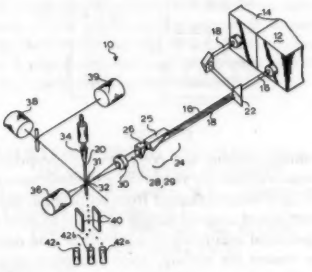
PRISMATIC BEAM EXPANDER FOR LIGHT BEAM SHAPING IN A FLOW CYTOMETRY APPARATUS

Vernon L. Chupp, Los Altos, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Mar. 5, 1984, Ser. No. 586,162

Int. Cl.⁴ G01N *33/48*

U.S. Cl. 356—39 **19 Claims**



1. A flow cytometry apparatus for determining characteristics of cells or the like flowing in a liquid stream comprising:

means for moving cells, substantially one at a time, in a liquid flow path;

means for providing an incident beam of illumination;

at least one prism interposed in the beam of illumination and having refractive capabilities to expand the beam in at least one direction as the beam exits said prism, said prism oriented so that the expanded beam is directed toward said

cells on an axis substantially transverse to the direction of said flow path;

means for focusing said expanded beam in a region of said flow path so that the vertical beam waist is less than the horizontal beam waist;

means for detecting light associated with each moving cell as it passes through said focused beam of illumination; and

means for using said detected light to determine characteristics of said cells.

4,545,678

METHOD AND APPARATUS FOR TESTING LENSES

Wolfgang Grimm, Heidenheim, and Hermann Schürle, Aalen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,264

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225343

Int. Cl.⁴ G01B *9/00*

U.S. Cl. 356—124 **14 Claims**

1. The method of testing lenses having locally non-uniformly distributed surface powers, which comprises substantially the steps of:

(a) providing a master lens having desired surface powers;

(b) providing an original test pattern;

(c) providing a ray path, and placing said master lens and said test pattern in said ray path;

(d) projecting light along said ray path successively from said test pattern and through said master lens onto a receiving surface to produce an image thereon;

(e) making a photographic record of said image;

(f) placing said record in said ray path at said receiving surface;

(g) substituting a lens to be tested for said master lens in said ray path;

(h) providing a comparison test pattern in said ray path at the location occupied by said original test pattern when light was projected to produce said image;

(i) projecting light along said ray path in a reverse direction successively through said record and said lens to be tested to the location of said comparison test pattern, to produce an image of said record at said location; and

(j) observing the relation of said image of said record to said comparison test pattern to determine possible deviation of surface powers of the lens being tested from those of said master lens.

4,545,679

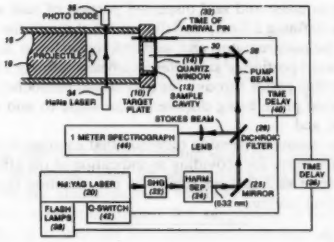
FREQUENCY SHIFT MEASUREMENT IN SHOCK-COMPRESSED MATERIALS

David S. Moore, and Stephen C. Schmidt, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 21, 1984, Ser. No. 581,934

Int. Cl.⁴ G01N *21/65*

U.S. Cl. 356—301 **5 Claims**



1. A method of determining molecular vibrational frequencies in shock-compressed materials, comprising the steps of:

applying a shock to a material sample so as to form a shock wave which travels through the sample;

directing a pulsed laser beam into the shocked sample in a direction opposite to that of the direction of travel of the shock wave; and

measuring, while the sample is shock-compressed, the frequency of the backward-stimulated Stokes beam emitted from the sample in the direction opposite to the direction of the laser beam.

4,545,680

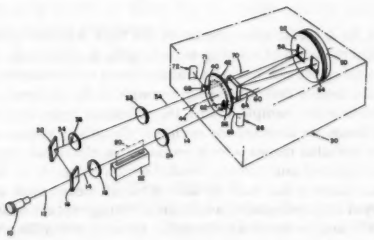
SPECTROANALYSIS SYSTEM

Stanley B. Smith, Jr., Westford, Mass., assignor to Allied Corporation, Morristown, N.J.

Filed Apr. 8, 1983, Ser. No. 483,111

Int. Cl.⁴ G01J *3/18, 3/42*

U.S. Cl. 356—319 **18 Claims**



1. A spectroanalytical system with compensation for source intensity fluctuations or the like comprising

means defining an analysis region,

a radiation source,

means for passing a first portion of radiation from said radiation source along a first (analysis) beam path through said analysis region for modification by sample material in said analysis region and for passing a second portion of radiation from said beam along a similar second (reference) beam path outside said analysis region,

a monochromator with two spaced aperture regions, said aperture regions being disposed in a plane that is perpendicular to the axis of said monochromator and arranged

such that an entrance aperture for the analysis beam and an exit aperture for a dispersed portion of the reference beam is provided in one aperture region and an entrance aperture for the reference beam and an exit aperture for a dispersed portion of the analysis beam is provided in the other aperture region, the apertures in each said aperture regions being defined by an elongated slit, and said monochromator being arranged such that radiation in each beam enters the monochromator adjacent one end of each slit and dispersed radiation from that beam exits the monochromator adjacent the opposite end of the other slit, said analysis beam and said dispersed portion of said analysis beam defining a first plane that passes through the axis of said monochromator and said reference beam and said dispersed portion of said reference beam defining a second plane that passes through the axis of said monochromator, said first plane being disposed at an angle to said second plane, and

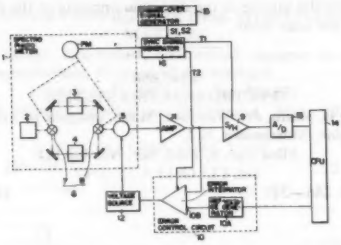
detector means for sensing radiation that emerges from said exit apertures for providing an indication of the effect of a sample in said analysis region on the radiation from said radiation source.

4,545,681

METHOD AND APPARATUS FOR CONTROLLING MEASUREMENT IN A SPECTROPHOTOMETER

Shinichiro Watanabe, Tokyo, Japan, assignor to Japan Spectroscopic Co., Ltd., Hachioji, Japan

Filed Feb. 9, 1983, Ser. No. 465,337
Claims priority, application Japan, Feb. 14, 1982, 57-22478
Int. Cl.[4] G01J *3/42*
U.S. Cl. 356—325 **11 Claims**



1. In a spectrophotometer of the type wherein monochromatic radiation of varying wavelengths is alternately directed to a reference cell having a transmittance of substantially 100% and a sample cell containing a sample to be analyzed to form reference and sample beams, the reference beam and the sample beam are detected for each wavelength by means of radiation detector means which produces an electrical output, and an output of said detector means which responds to the reference beam is fed back to said detector means such that said output may be equal to a reference voltage upon measurement of the sample at all wavelengths, thereby controlling the gain of said detector means, whereby in output of said detector means which responds to the sample beam represents the transmittance of the sample for each wavelength,

a method for controlling the measurement, comprising

a preparatory scanning stage including setting both the reference and sample cells to a substantially 100% transmittance state, scanning the reference and sample cells with radiation of each wavelength at which measurement is to be made in said state, feeding back an output of the detector means which responds to the sample beam during said scanning to said detector means such that the detector output responding to the sample beam may become constant at all wavelengths, thereby controlling the gain of said detector means, and storing an output of said detector means which responds to the reference beam during said scanning, and

a sample analyzing stage in which using the stored output for each wavelength of said detector means which has responded to the reference beam during said preparatory scanning or the corresponding voltage as a reference voltage, said detector means is controlled upon measurement of the sample sucn that an output of said detector means which responds to the reference beam may be equal to said reference voltage.

9. In a spectrophotometer comprising a radiation source capable of emitting monochromatic radiation of varying wavelengths, a reference cell, a sample cell, radiation detector means which produces an electrical output, and a beam path switching means for directing monochromatic radiation of varying wavelengths from the source alternately to the reference and sample cells to form reference and sample beams and directing in synchronism the reference beam and the sample beam to said detector means,

an apparatus for controlling the measurement comprising

a sample/hold circuit for sampling an output of said detector means in synchronism with a first timing signal,

a computer having a function of storing an output of said sample/hold circuit and reading out the data stored,

a reference voltage generating circuit for generating a reference voltage corresponding to the output signal of said sample/hold circuit previously stored in said computer,

an error control circuit for comparing the output of said detector means with the reference voltage in synchronism with a second timing signal and controlling in accordance with the difference the gain of said detector means, and

a sync signal generating circuit for generating said first and second timing signals in response to the switching of said beam path switching means, wherein

said sync signal generating circuit is switched between a first state in which said circuit generates as the first timing signal a signal within a duration when said detector means is producing an output by detecting the reference beam, and as the second timing signal a signal within a duration when said detector means is producing an output by detecting the sample beam, and

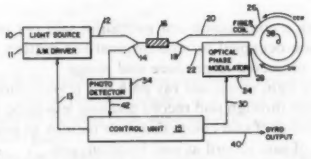
a second state in which said circuit generates as the first timing signal a signal within a duration when said detector means is producing an output by detecting the sample beam, and as the second timing signal a signal within a duration when said detector means is producing an output by detecting the reference beam.

4,545,682

OPTICAL GYROSCOPE

Ivan Greenwood, Stamford, Conn., assignor to The Singer Company, Little Falls, N.J.

Filed Aug. 11, 1983, Ser. No. 522,012
Int. Cl.[4] G01C *9/64*
U.S. Cl. 356—350 **10 Claims**



1. A fiber optic gyro comprising:

a source of light;

amplitude modulating and source driving means for driving the source;

an optic fiber coil rotatable about an axis of sensitivity;

means for optically coupling light from the source to the coil to create counterpropagating beams therethrough;

means connected intermediate the coupling means and the coil for optically phase modulating the beams propagating (a) in a first direction prior to introduction into the coil, (b) in a second counterpropagating direction after passage through the coil;

photodetecting means receiving the optically phase modulated counterpropagated light beams, for producing a signal at its output responsive to the coil rotation rate;

control means having its input connected to the photodetecting means output for translating the output signal from the photodetecting means to a variable frequency signal responsive to coil rotation rate;

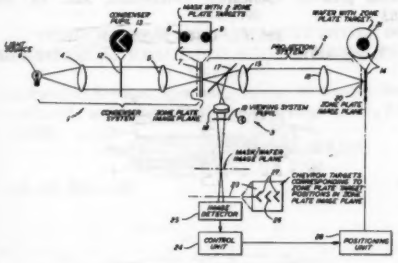
feedback means connecting an output of the control means to the amplitude modulating and source driving means for generating a phase-modulated source driving signal.

4,545,683

WAFER ALIGNMENT DEVICE

David A. Markle, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 28, 1983, Ser. No. 470,426
Int. Cl.⁴ G05D *3/00*
U.S. Cl. 356—400 **10 Claims**



1. A device for aligning a wafer with a mask prior to an exposure process with a projection system during which a circuit pattern is transferred from the mask to the wafer, said device comprising, in combination:

a first alignment pattern in the form of a zone plate on a surface of said mask;

a second alignment pattern in the form of a zone plate on a surface of said wafer;

a light source;

condenser means disposed between said light source and said mask for illuminating said first and second alignment patterns, said condenser means including a pupil aperture with a transparent region of predetermined shape;

projection means disposed between said mask and said wafer for projecting the mask pattern onto the wafer; and

viewing means for monitoring condenser pupil images formed by the mask and wafer zone plate patterns, said viewing means including a viewing system aperture with an opaque region geometrically similar to said transparent region.

4,545,684

ALIGNMENT MARK DETECTING APPARATUS AND METHOD

Yoichi Kuroki; Yukihiro Yoshinari, both of Kawasaki, and Ryozo Hiraga, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 22, 1982, Ser. No. 435,958
Claims priority, application Japan, Oct. 28, 1981, 56-172458
Int. Cl.⁴ G01B *11/00*
U.S. Cl. 356—400 **11 Claims**

1. An alignment mark detecting apparatus, comprising:

first supporting means for supporting a first body having at least one alignment mark thereon;

second supporting means for supporting a second body having at least one first alignment mark thereon for use in a step of aligning the first body and the second body, at least one second alignment mark thereon for use in another alignment step and at least one reference mark for discriminating between the first and second alignment marks on the second body;

detecting means for detecting the alignment mark on the first body, and the first and second alignment marks and the reference mark on the second body and for putting out a signal stream of signals representative of the marks;

signal processing means for receiving signals comprising said signal stream in accordance with a changeable timing and detecting a signal representing each mark from the received signals;

signal extracting means for extracting a signal representing the reference mark from the signal stream;

timing changing means for changing the timing in response to the signal representing said reference mark extracted by said extracting means; and

moving means for moving the first and the second supporting means relative to each other in response to the received and detected signals by said signal processing means in accordance with timing changed by said timing changing means to move the first body and the second body toward alignment.

4,545,685

MIXING DEVICE

Shiro Suehisa, Osaka, and Hideki Kajiwara, Yawata, both of Japan, assignors to Joto Chemical Company, Ltd., Osaka, Japan

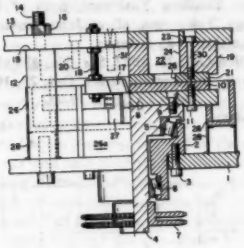
Filed Jun. 8, 1984, Ser. No. 618,742
Claims priority, application Japan, Feb. 15, 1984, 59-25164
Int. Cl.⁴ B01F *15/06*
U.S. Cl. 366—144 **12 Claims**

1. A mixing device comprising:

a pair of plate means coaxially aligned and spaced apart from each other to define therebetween a mixing zone, each plate means having a non-flat operating surface facing the other operating surface and being adapted so that, by movement of one or both plate means, a relative motion between the two operating surfaces may be maintained;

grooves provided in both of said operating surfaces and arranged so that the grooves of one operating surface may

cross the grooves of the other operating surface upon the relative motion between the two operating surfaces; and



removal means adapted to contact said plate means to remove the mixed product discharged from said mixing zone.

4,545,686

ELECTRONIC TIMEPIECE

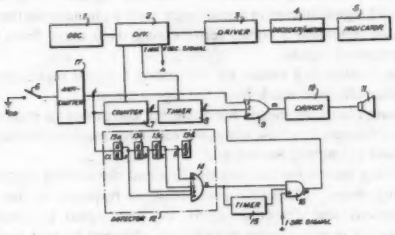
Kenichi Ushikoshi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 360,970

Claims priority, application Japan, Mar. 24, 1981, 56-43050; Dec. 28, 1981, 56-213245

Int. Cl.⁴ G04B *21/08, 23/02*

U.S. Cl. 368—63 **22 Claims**



1. In an electronic timepiece including a high frequency signal generator, frequency divider network dividing down said high frequency signal to lower frequency signals, a driver circuit receiving a divided frequency signal from said divider network, and an indicator of time operated by the output of said driver circuit, the improvement therein comprising a countdown timer, comprising:

input switch means;

audible output means;

driving circuit means for driving said audible output means, said audible output means being driven to an audible output in response to each actuation of said input switch means, said audible output means indicating the desired setting time of said timer function;

first counter means for counting and memorizing the number of actuations of said input switch means, said number of actuations defining a selected timed period, said first counter means being coupled to said input switch means;

second counter means coupled to said frequency divider network, said second counter means counting elapsed time after actuation of said input switch means;

coincidence detection means for detecting when the number of counts in said first counter means and the number of counts in said second counter means are coincident, said coincident detection means transmitting a signal to said audible output means upon said detection.

4,545,687

CLOCK CONSTRUCTION

Paul D. Rowan, Toronto, Canada, assignor to Umbra Shades Ltd., Scarborough, Canada

Filed Feb. 13, 1984, Ser. No. 579,252

Int. Cl.⁴ G04B *19/06*

U.S. Cl. 368—232 **12 Claims**

1. A clock having a face comprising:

a rigid planar base layer;

a resilient padding layer overlaying said base layer, on the forward face thereof

an enveloping film layer "surrounding said base layer and said padding" and a movement supported directly from said face.

4,545,688

WATCH CASE HAVING SYNTHETIC MATERIAL SEALS BETWEEN DETACHABLE PARTS THEREOF

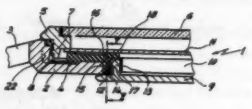
Claude Ray, La Chaux-de-Fonds, and Walter Schaeren, Bienne, both of Switzerland, assignors to Asuag-SSIH, Neuchatel, Switzerland

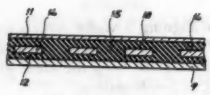
Filed Dec. 21, 1983, Ser. No. 563,807

Claims priority, application Switzerland, Jan. 10, 1983, 110/83

Int. Cl.⁴ G04B *37/00*

U.S. Cl. 368—291 **6 Claims**





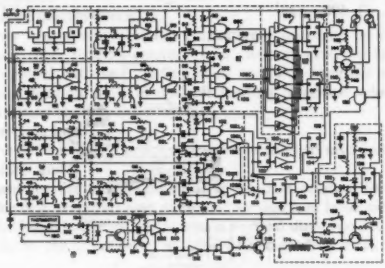
1. A watch case comprising a middle containing a lining of synthetic material and at least one detachable part detachably mounted in an opening of the middle by means of a pressure device, wherein a band of synthetic material constituting a seal is formed on the periphery of the opening, the lining and the band being made in one piece and connected by portions of synthetic material crossing passages of the middle, the opening having side walls which are at least partially devoid of lining and form a coupling surface together with an opposite surface of the detachable part to assure pressure coupling of the detachable part and compression of the band of synthetic material, said passages comprising vertical grooves made in the side walls of the opening, said vertical grooves being separated by unlined wall zones.

4,545,689

THERMOSTAT CALIBRATION APPARATUS

Timothy E. Dunavin, Rock Falls, and Michael A. Scarantino, Dixon, both of Ill., assignors to Harper-Wyman Company, Hinsdale, Ill.

Filed Nov. 30, 1984, Ser. No. 676,583
Int. Cl.[4] G01K *15/00*
U.S. Cl. 374—1 5 Claims



1. Apparatus for calibrating a thermostat comprising:

means for generating a calibration signal corresponding to a predetermined calibration temperature, said calibration signal having a predefined calibration time window;

means for generating control time window signals corresponding to a predefined calibration accuracy; and

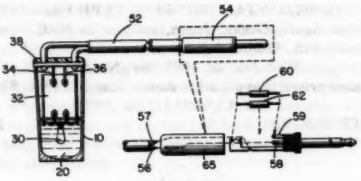
means for detecting an ON operation of the thermostat relative to said calibration window and said control windows to indicate the state of calibration.

4,545,690

TEMPERATURE MEASUREMENT PROBE FOR CHEMICAL REACTIONS AND METHOD OF USE THEREOF

Lawrence J. Zysman, Brea, and Malbone W. Greene, Vista, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 30, 1983, Ser. No. 509,901
Int. Cl.[4] G01K *1/14, 7/16*
U.S. Cl. 374—165 8 Claims



1. A method for indicating the temperature of an environment wherein said environment is adapted to receive and support a reaction vessel and said reaction vessel is adapted to hold chemicals during a chemical reaction, said method including the steps of:

placing a container having an external shape and size substantially identical to said reaction vessel into said environment in place of said reaction vessel, the container having a temperature sensor operationally coacting with a fluid in said container; and

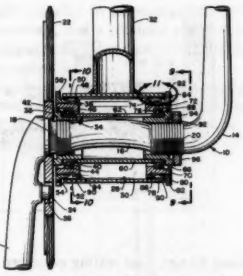
changing an electrical parameter of the temperature sensor proportional to the temperature of the container.

4,545,691

BICYCLE CRANK BEARING ASSEMBLY

B. Linn Kastan, 4946 N. Moorpark Rd., Moorpark, Calif. 93021, and Ysmael E. Romero, Santa Paula, Calif., assignors to B. Linn Kastan, Moorpark, Calif.

Filed Jul. 18, 1983, Ser. No. 514,529
Int. Cl.[4] F16C *9/02, 35/077*
U.S. Cl. 384—458 11 Claims



1. In combination with a hub, said hub having a substantially cylindrical internal chamber, a crank extending through said internal chamber, said crank having a straight center section each end of which is integrally attached to a separate elongated pedal arm, said straight center section being located within said internal chamber, a bearing assembly to be located about said straight center section within said internal chamber, said bearing assembly comprising:

a first bearing adapter threadably secured on said straight center section, a second bearing adapter threadably secured on said straight center section, said second bearing adapter being spaced from said first bearing adapter;

a first bearing assembly including a first inner race and a first outer race;

a second bearing assembly including a second inner race and a second outer race;

said first inner race being mounted on said first bearing adapter, said second inner race being mounted on said second bearing adapter;

means connecting together said first and second inner races, said second bearing adapter being threadingly tightenable to tightly secure in position said first and second bearing adapters with said means located therebetween; and

a first expanding member assembly mounted on said first outer race, a second expanding member assembly mounted on said second outer race, both said first and second expanding member assemblies being expandable into tight engagement with the wall of said internal chamber fixing said outer races to said wall yet permitting free rotation of said crank.

4,545,692

SEAL FOR A ROLLING BEARING UNIT

Johan C. M. Bras, Buurmalsen, and Antonio Gabelli, Ijsselstein, both of Netherlands, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

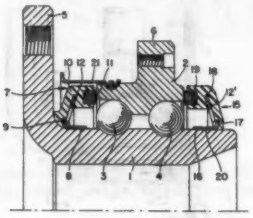
Filed May 19, 1983, Ser. No. 496,086
Claims priority, application Netherlands, Jun. 16, 1982, 8202445
Int. Cl.[4] F16C *33/72, 33/78*
U.S. Cl. 384—477 10 Claims

1. A first seal for a roller bearing unit including an outer race, an inner race with a radially extended attaching flange, and rows of rolling members between said races, comprising:

a first bushing subject to attachment about said inner race, said bushing including a radial flange at one end, said

radial flange facing said attaching flange on said inner race;

a first springy annular member including elastic material connected at one end to said first bushing and at the other end having a portion oriented toward a first annular main surface on said outer race, said first annular member further including a first dished spring ring, said first spring ring being at least partially imbedded in said elastic material, an inner edge of said first spring ring resting against



said bushing flange, said resting edge providing a fulcrum for pivotal motion in both axis directions of said first spring ring relative to said first bushing;

a first ring of a self-lubricating material in contact with said other end of said first springy annular member, in the assembled state of said seal on said roller bearing unit, said self-lubricating material being pressed against said first annular main surface of said outer race by springiness of said first annular member.

4,545,693

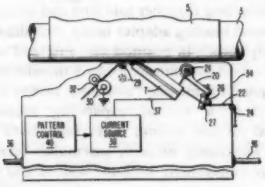
DRIVE FOR THERMAL PRINTING LIFT-OFF CORRECTION

John C. Bartlett; Alan E. Bohnhoff, both of Lexington; Donald F. Croley, Georgetown; Stanley Dyer, Lexington; Kenneth E. Edds, Versailles; Frank J. Horlander, and Donald W. Stafford, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,967

Int. Cl.[4] B41J *3/00*

U.S. Cl. 400—120 **20 Claims**



1. A thermal printer having a power source to power heat-producing elements in a column simultaneously moved across the area of a printed character which can be selectably activated as said elements pass across a character printed while in contact with a thermal transfer medium which forms a bond for lift-off correction of thermal printing from said transfer medium at temperatures above ordinary room temperatures and below a temperature at which printing from said transfer medium is effected, keyboard selection means to select a lift-off correction mode of operation, and means operative during each said lift-off correction mode of operation to apply power from said power source to substantially all of said heat-producing elements as said elements move across said character area, said power being in a series of pulses having the net effect of producing said temperature for lift-off correction and being applied to adjoining of said heat producing elements in substantially equal form and opposite phase.

4,545,694

INK SUPPLY DEVICE FOR AN INKING TYPE WIRE DOT PRINTER

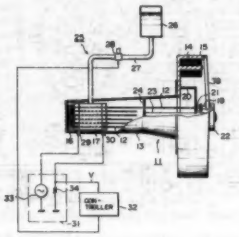
Yuki Ninomiya, Soka, and Haruhiko Yagi, Koshigaya, both of Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,894

Claims priority, application Japan, Jul. 23, 1982, 57-128371; Jul. 23, 1982, 57-128372; Mar. 31, 1983, 58-55648; Aug. 31, 1983, 58-55647

Int. Cl.[4] B41J *3/12, 27/02, 27/20*

U.S. Cl. 400—124 **9 Claims**



1. An ink supply device for an inking type wire dot printer comprising: a housing, a plurality of, printing wires supported projectably from one end of said housing, a plurality of wire driving means driven so as to individually project said printing wires from said one end of the housing, an ink chamber having a printing ink occlusion body disposed with the housing and into which the printing wires extend, an ink tank connected to supply ink to said ink occlusion body, valve means for electrically controlling the supply of ink from within the ink tank to the ink occlusion body, a pair of spaced detection electrodes for detection of the printing ink, the electrodes having upper ends which project from a lower surface to the interior of the housing and which press against the ink occlusion body, and a detection control circuit operative to control the valve means tp be turned ON or OFF by output signals from said detection electrodes, said ink occlusion body being positioned so that a lower surface thereof is positioned at a predetermined spacing from the lower surface of the housing such that the electrodes project into the spacing from the lower surface of the housing.

4,545,695

HORIZONTAL PRINTING TYPE PRINTER

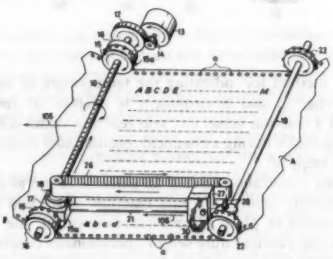
Kazuhiro Agata, Osaka, Japan, assignor to NEC Home Electronics, Ltd., Osaka, Japan

Filed Jan. 28, 1985, Ser. No. 695,829

Claims priority, application Japan, Jan. 31, 1984, 59-15781

Int. Cl.[4] B41J *3/28, 19/00*

U.S. Cl. 400—320 **2 Claims**



1. A horizontal printing type printer for printing lines on

sequence of pages having guide holes extending along top and bottom comprising:

a motor for head feeding and sheet feeding;

a reversible rotatable feeding shaft in a vertical direction perpendicular to the printing line direction and having a cam groove in the cylindrical outer surface thereof;

means for coupling said feeding shaft to said motor;

a pair of sheet feeding tractors engaging guide holes on the top and bottom of said pages respectively and rotatably mounted on said feeding shaft with a predetermined distance therebetween;

a pair of one-way clutches respectively provided on each said sheet feeding tractors, said one-way clutches being engaged with said feeding shaft to rotate together with said feeding shaft in a sheet feeding direction when a printing sheet is fed;

a printing head;

a guide rod spaced apart from and parallel to said feeding shaft; and

means for mounting said printing head in relation to said feeding shaft and said guide rod so that said head moved backwards and forwards in said vertical direction according to the direction of rotation of said feeding shaft.

4,545,696

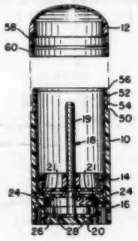
COSMETIC CONTAINER

John F. Carluccio, 836 High Mountain Rd., Franklin Lakes, N.J. 07417

Filed Jul. 28, 1983, Ser. No. 518,218

Int. Cl.⁴ B43K *5/06*

U.S. Cl. 401—175 **8 Claims**



1. A container of the propel-repel type comprising a casing, a carrier disposed in and moveable within said casing and having a threaded bore for receiving a screw, a threaded screw assembly having a knob and a threaded rod received in said threaded bore, and base means engaging said threaded screw assembly for supporting said assembly on said casing, wherein said carrier and said base means have aligned openings for filling, wherein said screw assembly has an opening alignable with the openings in said carrier and base means for filling, and comprising plug means for sealing the opening in said screw assembly after filling.

4,545,697

DEVICE FOR FIXING BY SCREWING ONTO A CHANNEL SECTION AND THE COMBINATION OF A CHANNEL SECTION AND SUCH A DEVICE

Serge Verdenne, Marcilly sur Tille; Didier Brocard, Dijon; Pierre Hardouin, Asnieres, and Félix Lameyre, Rueil, all of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Sep. 28, 1982, Ser. No. 426,185

Claims priority, application France, Oct. 7, 1981, 81 18846

Int. Cl.⁴ F16B *9/00;* **A44B** *17/00*

U.S. Cl. 403—230 **14 Claims**

1. A device for securing an object by screwing to a channel member having two flanges (7) directed substantially towards one another and defining therebetween a longitudinal opening, this device comprising:

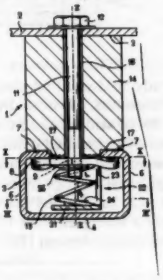
(a) a wedge member having a through bore and a channel member engaging face adapted to engage an outer face of both flanges;

(b) a bolt including in turn:

a first retaining member in the form of an elongated plate (8) rotatable in a plane substantially parallel to that of the flanges (7) of the channel member (3) between a free position in which a longitudinal direction of the plate is substantially parallel to a longitudinal direction of the channel member, and a retained position in which said plate (8) engages an inner face of both flanges (7) of the channel member;

a second retaining member (12) facing toward a face of the wedge member which is remote from the channel member engaging face;

a connection rod (11, 51) secured to one of the retaining



members (8, 12) and provided with a threaded portion adapted to threadingly engage a threaded bore of the other retaining member;

(c) resilient means urging the plate (8) towards the channel member engaging face of the wedge member; wherein

(d) the wedge member is interlocked with the plate for rotation about an axis (Z—Z) parallel to that of the connecting rod;

(e) the wedge member has on its channel member engaging face (17) at least one boss (34) adapted to fit between the flanges of the channel member (3) when the plate (8) is in the retained position; and

(f) the plate is provided with two opposite engagement zones (42) which are positioned to be the first portions of the plate to engage behind the flanges upon rotation of the plate from the free position towards the retained position, and which are spaced apart from the channel member engaging face of the wedge even when the resilient means is the least stressed.

4,545,698

CONNECTOR FOR DETACHABLE CONNECTION OF COMPONENTS OF FURNITURE OR THE LIKE AT RIGHT ANGLES TO EACH OTHER

Gerhard Koch, Nagold, Fed. Rep. of Germany, assignor to Hafele KG, Fed. Rep. of Germany

Filed Feb. 8, 1984, Ser. No. 578,135

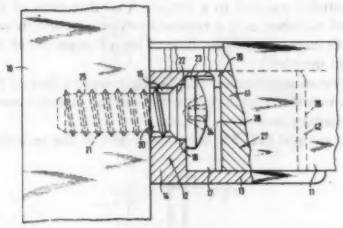
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1983, 8307977[U]

Int. Cl.⁴ B25G *3/00*

U.S. Cl. 403—231 **14 Claims**

1. A connector for detachably connecting components disposed at right angles to each other, said device comprising two fitting elements of which a first element is provided with a head section having laterally sloping wedge-shaped faces and a second fitting element is provided with a sloping groove into which said head of said first fitting element is accurately fitted so that in the assembled condition of said fitting elements said wedge-shaped surfaces of said head section are in secure contact with side faces of said groove, said first fitting element

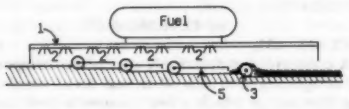
being in the form of a wedge block adapted to be screwed to a first component, said wedge-shaped surfaces of said wedge block and said side faces of said second fitting element being disposed at an acute angle to said first component, said second fitting element being in the form of a mounting sleeve inserted into the desired surface of said second component, characterized in that said first fitting element (12) comprises a screw (20) having a head (23) adapted to be screwed into said first component (10) to firmly hold said first element (12) thereto, that said wedge-shaped faces (18, 19) of said wedge block (14) and said side faces (29, 30) of said second fitting element (27) are in the form of sections of an inclined cylinder, that said wedge faces (18, 19) are convex and said side faces (29, 30) are concave to matchingly engage said wedge faces (18, 19), and that said first fitting element (12) has formed thereon a cover plate (13) to cover said second fitting element (27) and said wedge block (14) of said first fitting element (12).



4,545,699
PRIMER COMPOSITION FOR A LAMINATED REPAIRED ROAD
William E. Uffner, Newark, and Robert N. White, Etna, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Division of Ser. No. 182,530, Aug. 29, 1980, Pat. No. 4,471,094. This application Jun. 18, 1984, Ser. No. 621,955
Int. Cl.⁴ E01C *3/00, 5/12, 5/18*
U.S. Cl. 404—31 **4 Claims**

1. A laminated repaired road comprising a substrate, a primer on said substrate, said primer consisting essentially of the reaction product of 5 to 40% by weight of a liquid, tacky, depolymerized diene rubber having an average molecular weight below 110,000, and 95 to 40% by weight of a terpene resin, and a fibrous reinforced road repair membrane having an adhesive layer on one side thereof, said adhesive layer being in adhered contact with said primer.

4,545,700
PROCESS FOR RECYCLING BITUMINOUS ASPHALT PAVEMENT
Larry A. Yates, 889 Gardendale Dr., Columbia, S.C. 29210
Continuation of Ser. No. 423,490, Sep. 24, 1982, abandoned. This application Apr. 6, 1984, Ser. No. 597,205
Int. Cl.⁴ E01C *7/06*
U.S. Cl. 404—75 **3 Claims**



1. A process for recycling asphalt pavement from a road surface by heating, milling and mixing in which an apparatus either drawn pushed or self propelled uses a series of heaters and mills to sequentially strip away relatively thin layers of asphalt pavement to a desired depth for recycling of the asphalt pavement, said process comprising in a single pass of a single machine, the steps of:

(a) heating an upper layer of the asphalt pavement to be recycled to a depth of at least one quarter of an inch to render the upper layer of asphalt pliable;

(b) following said step of heating, milling of the upper layer of the pliable asphalt with a screw auger resting upon the upper layer of the pliable asphalt and thereby, removing the upper layer of pliable asphalt from the road surface

(c) during said step of milling and removing, simultaneously mixing the removed pliable upper layer of asphalt from the road surface, in situ, with the screw auger;

(d) collecting said pliable layer of asphalt into at least one chute and, exposing an underlying layer of cooler asphalt to be heated;

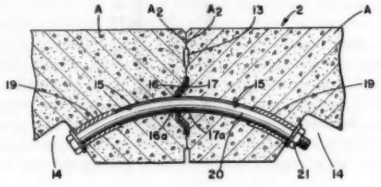
(e) heating the underlying layer of cooler asphalt to a depth of at least one quarter of an inch to render the upper layer of the underlying asphalt pliable;

(f) repeating steps (b), (c), and (d), and step (e) in all but the last sequence of a multiple sequence until at least one inch of the asphalt pavement is removed from the road surface;

(g) treating the removed asphalt pavement with an additive; and

(h) reapplying the mixed and treated layers of asphalt to the road surface, for surfacing the road with recycled asphalt pavement.

4,545,701
TUNNEL WALL STRUCTURE
Junichi Tsuzuki, 6-30-8, Seijo, Setagaya-ku, Tokyo 157, Japan
Filed Aug. 4, 1983, Ser. No. 520,385
Claims priority, application Japan, Aug. 6, 1982, 57-136888
Int. Cl.⁴ E21D *11/00*
U.S. Cl. 405—153 **4 Claims**



1. A tunnel wall structure comprising a plurality of rings, each said ring having an axis and being comprised of a plurality of arcuate segments of reinforced concrete having circumferentially opposite ends and axially opposite sides with respect to said axis, circumferentially adjacent segments of each ring having circumferentially abutting ends, said plurality of rings being axially adjacent to one another and axially adjacent to said segments of said rings having axially abutting sides, first joint means between said circumferentially abutting ends comprising a pair of circumferentially opposed joint members each embedded in a corresponding portion of said abutting ends, said joint members having aligned central bolt holes opening circumferentially therethrough, said first joint means further including anchor members secured to said joint members and extending circumferentially therefrom into the corresponding segment, and a first bolt extending through said aligned central bolt holes and receiving a first nut to hold said circumferentially adjacent segments together, and second joint means between said axially abutting sides of said axially adjacent segments, said second joint means including aligned curved bolt holes extending axially through the abutting sides of said axially adjacent segments, a concave positioning member secured on each of said abutting sides of said axially adjacent segments, said positioning members having openings aligned with said curved bolt holes and being in mating engagement with one another, and a curved second bolt extending through

said curved bolt holes and said openings through said positioning members, and said curved bolt receiving a second nut to hold said axially adjacent segments together.

4,545,702

BORING-INJECTION DEVICE, METHOD FOR IMPROVING GROUND BY MEANS OF THE DEVICE AND METHOD FOR INVESTIGATING GROUND STATE BY MEANS OF THE DEVICE

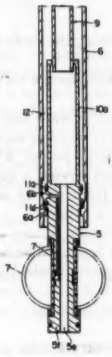
Sakae Sano; Hisashi Kitajima, both of Tokyo; Hiroshi Iimori, Yokohama, and Tadashi Nishio, Koganei, all of Japan, assignors to Toa Grout Kogyo Co., Ltd.; Mitsui Toatsu Chemicals, Inc. and Tonan Kaihatsu Kogyo Co., Ltd., all of Tokyo, Japan

Filed Jun. 27, 1983, Ser. No. 508,380

Claims priority, application Japan, Jul. 2, 1982, 57-114046; Jul. 2, 1982, 57-114047; Dec. 6, 1982, 57-212743; Apr. 19, 1983, 58-67784

Int. Cl.[4] E02D *3/12, 5/18*

U.S. Cl. 405—269 19 Claims



1. In a boring-injection device comprising:

a fluid supplying hollow rod;

a sheath disposed coaxially around said fluid supplying hollow rod so as to be movable relative to one another in an axial direction;

an end tube arranged to be protrusible beyond and retractable within the end portion of the sheath, said end tube being in communication with the fluid supplying hollow rod and being provided with at least one fluid discharge port for discharging a fluid supplied through the fluid supplying hollow rod, and a packer element fitted around the end tube so as to be inflatable by a pressurized fluid;

an annular pressurized fluid passage space arranged between the fluid supplying hollow rod and the sheath, the forward end of the annular space being defined by an end face of a piston member formed on the end tube and adapted to slide on the inner peripheral surface of the sheath, whereby the pressurized fluid introduced into said annular passage space acts to urge the piston member and the end tube toward a direction to which the end tube is protruded; and

a passage formed in the end tube to communicate said annular passage space with the packer element and inflate the latter by the supplied pressurized fluid just after the end tube is completely protruded from the sheath.

4,545,703

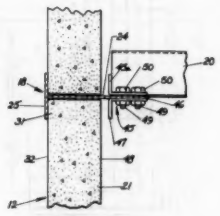
CONCRETE FACED BIN WALL

Jerald H. Boynton, Franklin, Ohio, assignor to Armco Inc., Middletown, Ohio

Filed Feb. 9, 1983, Ser. No. 465,170

Int. Cl.[4] E02D *17/00, 29/02*

U.S. Cl. 405—273 21 Claims



1. A soil tight bin-type retaining wall having front, rear and side walls:

a. a plurality of pairs of T-shaped connectors, each of the connectors having a web portion substantially normal to and positioned centrally on a flange portion, one connector of each pair being positioned in the plane of the front wall and the other connector of each pair being positioned in the plane of the rear wall;

b. a plurality of stringers forming the rear wall, each of the stringers being supported by two connectors positioned in the plane of the rear wall;

c. a plurality of stringers forming the rear wall, each stringers being supported by two connectors positioned in the plane of the rear wall;

d. a plurality of spacer members forming each side wall, each spacer member being supported by the web portion of a pair of connectors;

e. a plurality of cementitious panels forming the front wall, each end portion of the front face of each cementitious panel being supported by the flange portion of a connector positioned in the plane of the front wall to support the cementitious panel in a substantially erect position; and

f. a retaining means on the web portions of the connectors for retaining the cementitious panels of the front wall in a substantially erect position, whereby a retaining wall having a plurality of bins with a cementitious panel front wall is formed, said retaining means comprising one or more angles members being L-shape in cross section and including a connecting leg and a positioning leg, said connecting leg being joined to the web portion of a convector, and the positioning leg lying either adjacent to or abutting against one or more cementitious panels of the front wall.

4,545,704

METHOD AND APPARATUS FOR THE PNEUMATIC CONVEYANCE OF FINE MATERIAL

Otto Heinemann, Ennigerloh, Fed. Rep. of Germany, assignor to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 574,996

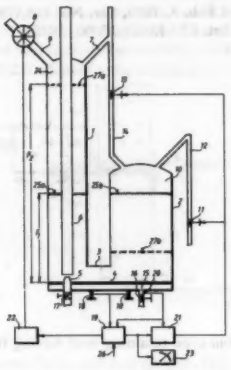
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1983, 3309210

Int. Cl.[4] B65G *53/36, 53/40*

U.S. Cl. 406—32 15 Claims

7. In apparatus for pneumatically conveying fine material comprising a conveyor vessel having an aerated base, means for supplying said vessel with material, a pneumatic conveyor pipe in communication with said vessel for conveying material outwardly therefrom, a conveyor nozzle communicating with said conveyor pipe, and means for supplying said base and said nozzle with compressed air, the improvement comprising a material storage chamber in communication with said vessel,

said chamber having an aerated base; means for establishing a pressure on material in said chamber; and means for varying



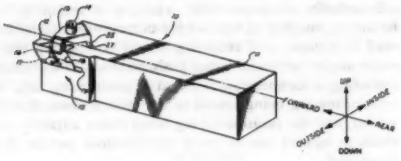
the pressure on material in said chamber to enable material from said chamber to flow into said vessel and vice versa.

4,545,705

INSERT RETAINING APPARATUS

Lloyd R. Benson, Houston, Tex., assignor to Triangle Grinding Inc., Houston, Tex.

Filed Aug. 23, 1983, Ser. No. 526,055
Int. Cl.⁴ B26D *1/00*
U.S. Cl. 407—108 **6 Claims**



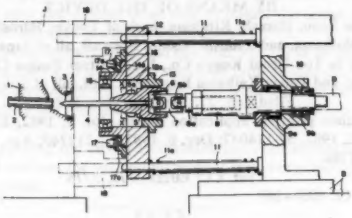
1. A securing system for a cutting tool comprising a tool holder, a pocket in said tool holder defined by a first sidewall, a bottom wall and a rear wall, a cutting insert receivable by said pocket and defined by an outside surface, an upper surface and an inner sidewall surface, a clamp operable to hold said insert in said pocket and connection means to connect said clamp to said tool holder, said insert having a recess defined by a diagonal wedge shaped face extending from said outside surface to said upper surface and a rearwardly located planar surface extending downwardly from said upper surface and terminating at said wedge shaped face, said clamp having a first wedge portion complementary to said wedge shaped face of said insert and a second planar portion complementary to said rearwardly located planar surface and being operable when connected to said tool holder to exert a fastening force on said wedge shaped face and said rearwardly located surface of said recess of said insert to seat said insert against said sidewall, bottom wall and rear wall.

4,545,706

METHOD AND MACHINE FOR MACHINING THE SURFACE OF A VALVE SEAT

Minoru Hiroyasu, Saitama; Shigeru Yamagishi; Hideo Yamashita, both of Tokyo; Susumu Yamada, and Koji Takahashi, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00060, § 371 Date Oct. 27, 1982, § 102(e) Date Oct. 27, 1982, PCT Pub. No. WO82/03032, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 5, 1982, Ser. No. 441,512
Claims priority, application Japan, Mar. 7, 1981, 56-31937
Int. Cl.⁴ B23B *35/00, 41/12*
U.S. Cl. 408—1 BD **7 Claims**



1. A method for machining the surface of a valve seat, which comprises the steps of:

setting a workpiece containing a valve guide and said valve seat;

moving a rotary holder toward said workpiece, which rotary holder has a pilot member and an edged tool member both fixed on said rotary holder, while guiding said rotary holder inclinably and having a guide bore of said valve guide caught by a front end of said pilot member, said pilot member being a reamer;

further moving said rotary holder toward said workpiece allowing said rotary holder to be bendable with respect to the direction of a spindle while following said guide bore and while reaming said guide bore;

retaining the posture of said rotary holder by holding its rear portion firmly;

further moving said rotary holder toward said workpiece, while rotating said rotary holder, thereby allowing said edged tool member to machine the surface of said valve seat while said guide bore is reamed;

moving said rotary holder away from said workpiece; and

removing said workpiece.

4,545,707

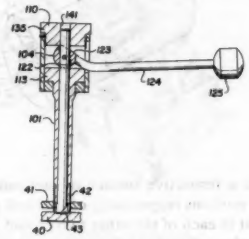
DRILLING DEVICE FOR PIPE JOINTS

Earl C. Bradley, Jr., Eastland, and John vander Linden, Plano, both of Tex., assignors to Earl C. Bradley, Eastland, Tex.

Filed Dec. 30, 1982, Ser. No. 454,876
Int. Cl.⁴ B23B *45/06*
U.S. Cl. 408—111 **3 Claims**

1. A set screw socket drilling tool for forming a blind hole in a surface of a first member to receive a tip of a set screw extending from an adjacent second member, said tool comprising: a tubular thrust sleeve having an externally threaded first end engageable in a set screw hole of said second member, said sleeve having an external annular flange around a second opposite end thereof; a tubular housing rotatable on said second end of said thrust sleeve, said housing having an internal annular retainer flange at a first end thereof engageable with said flange on said thrust sleeve, said housing having an open second opposite end and a longitudinal opening a side thereof located between said second end of said housing and said flange on said thrust sleeve when said thrust sleeve is in said housing; a cutter spindle having a drilling tip on a first end thereof rotatably positioned in the bore of said thrust sleeve,

said drilling end of said spindle being extendable from said first end of said thrust sleeve for drilling said set screw socket in said first member when said first end of said thrust sleeve engages said first member, said spindle having a second end portion thereof extending outwardly from said second end of said thrust sleeve, said second end portion of said spindle having a transverse lock pin hole; a cam mounted on said second end portion of said spindle on an axis of rotation coincident with the axis of said transverse lock pin hole through said spindle, said cam having a deviated hole there through extending transverse to said axis of rotation of said cam, said second end portion of said spindle being disposed through said deviated hole, said cam having a cam surface lying in a plane perpendicular to a line extending through said axis of rotation



and parallel to said axis of rotation, said cam surface being movable from a first position perpendicular to the logitudinal axis of said spindle to a second position disposed at an angle with said axis of said spindle; an end cap on said housing, said end cap having an inside thrust surface lying in a plane perpendicular to said longitudinal axis of said spindle for engagement by said cam surface whereby rotation of said cam from said first position to second position advances said spindle in said thrust sleeve toward said first member for drilling said set screw socket in said first member; and a handle secured at a first end with said cam and extending through said longitudinal opening in said housing for turning said spindle and rotating said cam to advance said spindle in a drilling direction as said spindle is turned.

4,545,708

METHOD FOR PRODUCING CROWNED TOOTH FLANKS ON A TOOTHED WORKPIECE, AND A MACHINE SUITED THEREFOR

Karl Buschhoff, and Heinrich Fischer, both of Munich, Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,493

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142843; Mar. 5, 1982, 3207924

Int. Cl.⁴ B23F *19/06*

U.S. Cl. 409—49 **11 Claims**

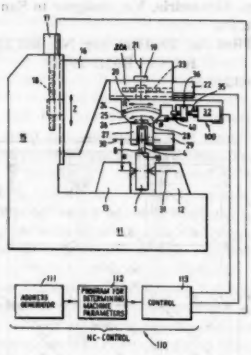
3. A machine for precision working of tooth flanks on a toothed workpiece rotatably supported in a machine frame, comprising:

frame means;

plunge carriage means mounted on said frame means and drive means for moving said plunge carriage means toward and away from a workpiece along a direction perpendicular to an axis of rotation of said workpiece;

adjusting carriage means and rotary clamping means for pivotally suspending said adjusting carriage means from said plunge carriage means and for movement about a first axis, said adjusting carriage means including a guide carrier suspended from said rotary clamping means, a feed carriage movably mounted on said guide carrier, a rocking support movably mounted on said feed carriage and a tool rotatably mounted on said rocking support, said rocking support including means for effecting a tilting of an axis of rotation of said tool in a plane and about an axis perpendicular to said plane, the movement of said feed carriage effecting a movement of said tool across the width of said workpiece;

control means for effecting a smooth and continuous varying of the position of said tool relative to said rocking support and thence the tilting of said axis of rotation of said tool in said plane about said axis perpendicular to said plane and



for independently, smoothly and continuously varying the position of said plunge carriage means and said tool relative to said workpiece, all in response to the position of said tool along the width of said workpiece determined by the position of said feed carriage;

whereby a smooth and continuously varying crowned surface is produced on said teeth of said workpiece.

4,545,709

MACHINE FOR THE ENCIPHERMENT OF KEYS

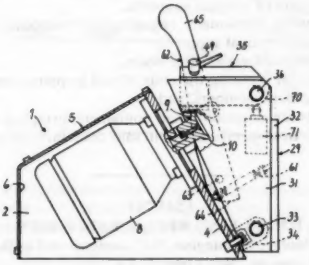
Claudio Ferruzzi, Faenza, Italy, assignor to Industrie Metaimeccaniche Perugia I.M.P. S.p.A., Pievaiola, Italy

Filed Mar. 22, 1983, Ser. No. 477,718

Claims priority, application Italy, Apr. 5, 1982, 3391 A/82

Int. Cl.⁴ B23C *1/16*

U.S. Cl. 409—83 **9 Claims**



1. A machine for the encipherment of keys in particular for transferring a reference key profile to a key blank, characterized in that it comprises a cup cutter keyed to a shaft driven by an electric motor, a bracket articulated about a perpendicular axis to the cutter axis of rotation, a feeler with an axis on one side of the cutter and located at the same distance as said cutter away from the bracket articulation axis and having a shape contacting the reference key substantially the same as said cutter, a stand journalled to said bracket about a parallel axis to the bracket articulation axis, a pair of clamps on the stand for clamping and locating a key blank and reference key in respective parallel planes containing the cutter rotation axis and the

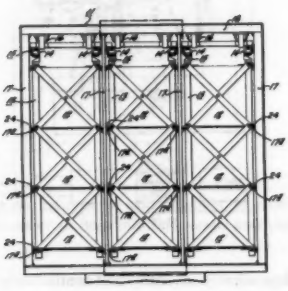
feeler axis which planes are perpendicular to the bracket articulation axis, said keys being set at an angle in the 15° to 45° range when juxtaposed with said cutter and feeler.

4,545,710

APPARATUS FOR AUTOMATED LESS-THAN-TRUCK LOAD SHIPMENTS

Peter S. Hepp, Alexandria, Va., assignor to Sun Carriers, Inc., Philadephia, Pa.

Filed Jul. 29, 1982, Ser. No. 403,223
Int. Cl.⁴ B65D *19/38*
U.S. Cl. 410—32 **5 Claims**



1. A supported container assembly adapted for transport within a vehicle having a container-carrying portion, comprising:

(1) a first container,

(2) a second container vertically stacked on said first container,

(3) a lower pair of horizontally extending gripping members each having an inwardly extending flange and an upwardly extending flange gripping the bottom and sides of said first container, and each having ends extending beyond the first container at either end,

(4) an upper pair of horizontally extending gripping members each having an inwardly extending flange and a downwardly extending flange gripping the top and sides of said first container and each having an upwardly extending flange gripping the sides of said second container,

(5) two pairs of vertical supports,

(6) means for frictionally engaging said gripping members with said vertical supports,

(7) two pairs of vertical members,

(8) means for securing the ends of said gripping members to said vertical members, and

(9) means for suspending said containers, gripping members and vertical members within said container-carrying portion.

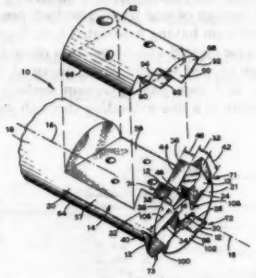
4,545,711

TOOL USING REPLACEABLE BITS

Jimmy B. Dooley, Wilmington, N.C., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 9, 1982, Ser. No. 356,589
Int. Cl.⁴ B23B *51/00*
U.S. Cl. 408—197 **12 Claims**

1. A milling tool for cutting internally of a bore by means of replaceable bits, the tool comprising an elongate bar member having a rotational axis, a shank portion on said bar member, an end portion on said bar member which end portion includes a centrally disposed axially outer portion and a pair of axially outer portions disposed on respectively opposite sides of said rotational axis and extending radially outwardly from said centrally disposed portion, a pair of clamping members detachably attached to said end portion on respectively opposite sides of said rotational axis and forming with said end portion an axially outer surface of the tool and including axially outer portions which form with said axially outer portions of said bar member four slots in said surface for clamping engagement of radially extending bits, means for detachably attaching said clamping members to said end portion, and means for clamping a bit in each of two of said slots between a respective surface of said axially outer portion of one of said pair of clamping



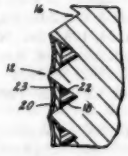
members and a respective surface of said radially extending axially outer portions respectively of said end portion and for clamping a bit in each of the other two of said slots between a respective surface of said axially outer portion of the other of said pair of clamping members and a respective surface of said radially extending axially outer portions respectively of said end portion.

4,545,712

THREAD LOCK

Richard B. Wallace, Bloomfield Hills, Mich., assignor to The Oakland Corporation, Troy, Mich.

Filed Aug. 11, 1983, Ser. No. 521,972
Int. Cl.⁴ F16B *39/02*
U.S. Cl. 411—258 **8 Claims**



1. A threaded fastener provided with an annular band extending completely around the threaded portion of said fastener and encompassing several adjacent threaded convolutions, a uniform deposit extending completely around each thread valley convolution within said band, said deposit comprising at the bottom of each thread groove a fluid polymerizable resin and a fluid layer of a polymerizing activator for said resin overlying said resin, the deposit of polymerizable fluid resin and fluid activator together substantially filing the thread groove, but received wholly within the thread groove, a barrier film at the confronting surfaces of said resin and activator composed of fully polymerized resin effective to prevent further polymerization of said resin while said film is intact, and a strong, thin, non-tacky protective film overlying said deposit.

4,545,713

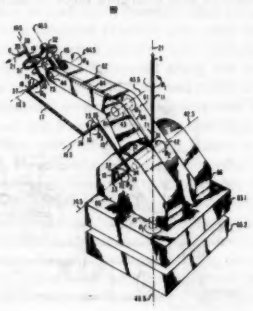
WAVEGUIDE ROBOT SYSTEM FOR LASER BEAM

Gerardo Beni, Old Bridge; Thomas J. Bridges, Holmdel; Susan Hackwood, Freehold, and Chinlon Lin, Holmdel, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 10, 1983, Ser. No. 550,617

Int. Cl.⁴ B25J *19/00*

U.S. Cl. 414—1 **9 Claims**



1. A waveguide robot system comprising:

(a) first and second robot arm segments, the first arm segment having first and second mutually perpendicular axles to enable first and second rotations, respectively, of the first robot arm segment, and a third axle to enable movement of the second arm segment relative to the first arm segment;

(b) side shields into which the second axle is mounted;

(c) in succession, first and second waveguide arm segments, first and second waveguide corner segments, and a third waveguide arm segment, each such waveguide segment rigidly connected at one end at a right angle to another end of the next succeeding segment, the second waveguide corner segment having a revolute joint, the axis of the first waveguide arm segment aligned colinearly with the axis of the first robot axle, the axis of the second waveguide corner segment aligned colinearly with the axis of the second robot axle.

4,545,714

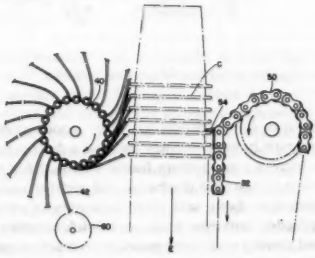
APPARATUS AND METHOD FOR FORMING STACKS OF NESTED CONTAINERS EACH HAVING A PREDETERMINED COUNT OF CONTAINERS

David E. Johnson, and Donald W. Myers, both of Canandaigua, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,629

Int. Cl.⁴ B65G *57/03*

U.S. Cl. 414—30 **20 Claims**



1. An apparatus for separating stacks each consisting of a predetermined count of nested containers from a supply of said containers; comprising:

(a) means for feeding a continuous supply of containers to a first station; detector means at said station for determining the presence of said containers;

(b) means for advancing a continuous flow of said containers in nested relationship from said first station to a second station;

(c) means at said second station for sequentially stacking said nested containers at a predetermined rate while advancing said containers through said second station; and means operatively coacting with said stacking means for separating a requisite count of said nested containers into individual stacks and for conveying said separated stacks of containers from said apparatus, said container stacking means of said second station comprising at least one rotatable wheel, a plurality of resilient members spaced about and extending radially outwardly from said wheel, said resilient members being adapted to engage the edge of each said container so as to bias said container downwardly into predetermined nested relationship with a preceding container, said coacting means including a protuberance intermittently engaging the trailing edge of one said container of said nested containers at intermittent time intervals and at a downward speed of movement higher than the speed of rotation of said wheel to thereby separate and advance stacks each constituted of a predetermined count of said nested containers from said second station.

4,545,715

PROCESS AND APPARATUS FOR TRANSPORTING PILES OF SHEETS

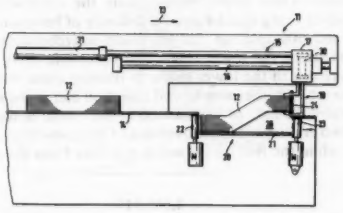
Joachim Seefeldt, Neuffen, Fed. Rep. of Germany, assignor to Bielomatik Leuze GmbH & Co., Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 497,134

Claims priority, application Fed. Rep. of Germany, May 28, 1982, 3220095

Int. Cl.⁴ B65H *31/30*

U.S. Cl. 414—36 **5 Claims**



3. An aparatus for removing piles of sheets transported along a substantially horizontal flat feed transport path, the feed transport path defining leading and trailing ends for each pile, the apparatus comprising:

a removal path disposed adjacent to, at a lower level than and transversely of the feed transport path;

a pair of removal conveyors for piles on the removal path, the removal conveyors forming lateral boundaries for the removal path separated by a distance such that the leading and trailing edges are substantially in surface engagement with both removal conveyors when the piles lie flat on the removal path;

a gripper mounted for reciprocating movement along the feed transport path and adapted to grip the leading end of a pile, the gripper reciprocating in a working region extending above the feed transport path and over the removal path; and,

means for opening and closing the gripper, keeping the gripper closed when the trailing edge of the pile falls from

the transport path thereby forming an S-curve in the pile which shortens its length in the transport direction, and then opening the gripper to let the front edge fall onto the removal path, the pile assuming its full length, lying on the removal path with the leading and trailing ends substantially in surface engagement with the removal conveyors.

4,545,716

HAY BALE FEEDER

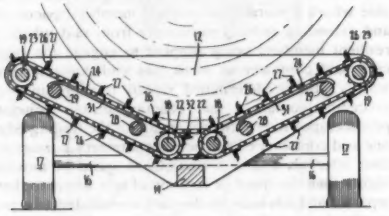
Arthur W. Pearce, Weering, Victoria, Australia

Filed May 21, 1984, Ser. No. 612,425

Claims priority, application Australia, May 24, 1983, PF9506

Int. Cl.[4] A01D *87/12*

U.S. Cl. 414—24.6 **10 Claims**



1. A bale feeder comprising a cradle means, support means to support the cradle means above the ground, said cradle means including front and rear walls and two conveyors mounted between the front and rear walls and movable transversely of the cradle, the conveyors being angularly disposed relative to each other and defining an included angle of between about 110° and 140°, the conveyors each extending at approximately the same angle to a horizontal plane, each conveyor comprising upper and lower longitudinal shafts, a pair of endless chain or belt means engaged on sprockets or pulleys on the shafts, a plurality of slat means carried by the pair of chain or belt means and extending longitudinally of the cradle, and flail means on at least some of the slat means to engage the surface of a bale carried in the cradle, the lower shafts of each conveyor being spaced apart a distance of between about 150 mm and 500 mm, an endless chain interconnecting aligned sprockets on the lower shafts and reversible drive means for driving one of the lower shafts to thereby cause both conveyors to move in the same lateral direction and at the same speed whereby the bale of hay carried in the cradle is supported by the two conveyors and movement of the conveyors rotates the bale while the flail means act to tear hay from the bale.

4,545,717

MACHINE FOR CHARGING A GLASS MELTING TANK FURNACE

Fritz Wittler, Hürtgenwald-Gey, and Michael Fraikin, Heimbach, both of Fed. Rep. of Germany, assignors to Zimmermann & Jansen GmbH, Düren/Rhld., Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,584

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206174

Int. Cl.[4] C03B *3/00*

U.S. Cl. 414—166 **10 Claims**

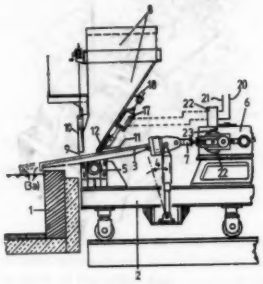
1. A machine for charging a glass melting tank furnace, comprising:

a hopper including a delivery chute having a rear wall;

a charging table having a reciprocating forward and return movement and an upper surface disposed beneath said hopper delivery chute defining a slot therebetween;

at least one movable scraper adapted for movement between an inoperative and operative position, in the latter of which it serves to seal the slot between said rear wall of said hopper and the upper surface of said charging table, said scraper having longitudinal slots widened in the direction of movement of said scraper engageable with guide bolts extending from the rear wall of said hopper for guiding said scraper during the movement thereof;

means for moving said scraper comprising at least one pressure medium cylinder secured to the rear wall of said hopper for effecting lifting and lowering of said scraper, the admittance of pressure medium into said pressure medium cylinder being controlled in dependency on the movements of said charging table in such a manner that



said scraper is lifted during the forward movement of said charging table and is lowered during the return movement of said charging table; and

an adjustable and lockable prescraper mounted between said movable scraper and said rear wall of said hopper having longitudinally extending openings therein for receiving said guide bolts extending from the rear wall of said hopper, said guide bolts each including a spacer engaging against said prescraper to press the same against the rear wall of said hopper.

4,545,718

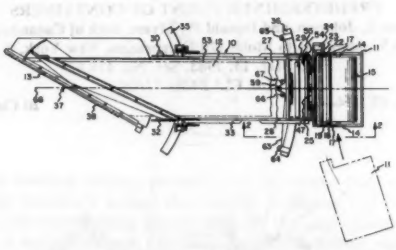
BIAS CUTTER FEEDER AND LETOFF TRUCK

Richard P. Marshall, Richfield, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 392,563, Jun. 28, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 627,112

Int. Cl.[4] B65H *25/26*; B65G *65/00*; B26D *5/20*; B29H *17/02*

U.S. Cl. 414—401 **9 Claims**



1. Apparatus for transporting sheet goods comprising a feeder conveyor having an entry end and a discharge end, said conveyor having a supporting frame mounted for movement about a pivot axis at said discharge end and for arcuate transverse movement about said pivot axis at said entry end to adjust the feeder conveyor position, a truck member for transporting and storing said sheet goods, said truck member being supported on wheels and movable into an operating position adjacent said frame at said entry end of said feeder conveyor, said frame having a transverse member, a single connecting

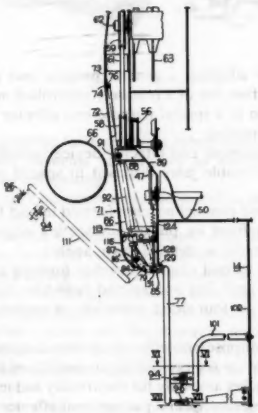
means for releasably connecting said truck member and said frame after said truck member is moved into said operating position, said connecting means including an elongated outer slide member slidably mounted around said transverse member of said frame for maintaining said truck member in said operating position, a hinged plate on said slide member having a length substantially the same as the length of said slide member and movable about a transverse axis into a raised position to provide clearance between said frame and said truck member during movement of said truck member relative to said feeder conveyor and to a lowered position over said truck member after movement of said truck member into said operating position and fastening means positioned along the length of said hinged plate for connecting said plate and said truck member in said lowered position, power means interposed between said slide member and said frame for moving said slide member and said truck member transversely of said frame, sensing means for determining the position of at least one edge of said sheet goods as it is conveyed from said truck member to said feeder conveyor, and said slide member being movable by said power means along said transverse member in response to said sensing means to move said truck member and said sheet goods relative to said supporting frame to compensate for deviations in the position of said edge of said sheet goods from a predetermined position as it is conveyed from said truck member to said feeder conveyor.

4,545,719

BIFOLDING SHIELD FOR AGRICULTURAL HARVESTER

Garry W. Busboom, Independence, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed May 29, 1984, Ser. No. 614,531
Int. Cl.[4] B62D *25/12*
U.S. Cl. 414—523 **12 Claims**



1. In combination with a vehicle, a bifolding side panel structure with inboard and outboard sides, comprising:

a first upright panel having its upper end pivotally connected to said vehicle for swinging movement in an outboard direction about a first generally horizontal axis between a downwardly extending closed position and an open position wherein the lower end of said first panel is disposed outwardly away from said vehicle,

a second upright panel having its upper end pivotally connected to said lower end of said first panel for relative swinging movement in one direction about a second generally horizontal axis between a closed position in which it extends downwardly from said first panel and an open position in angular relation to said first panel,

a resilient linear actuator,

pivot means pivotally connecting one end of said actuator to said vehicle at a first point spaced from said first axis, and

pivot means pivotally connecting the other end of said actuator to said second panel at a second pivot point spaced from said second pivot axis to produce a line of thrust passing near said first axis and on the outboard side of said second axis when said panels are in their closed positions whereby said second panel is biased by said actuator toward its closed position,

said second panel being manually swingable from its closed position to its open position wherein the pivot point between said second panel and said other end of said actuator is shifted to a position wherein the line of thrust of said actuator passes on the inboard side of said second axis whereby said second panel is biased toward its open position,

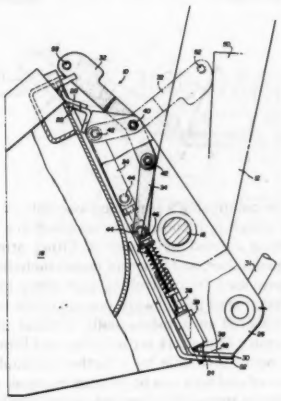
said first panel being movable from its closed position to its open position wherein said actuator biases said first panel toward its open position.

4,545,720

QUICK COUPLER ASSEMBLY

Gary L. Cochran, and Dean O. Baum, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed May 17, 1984, Ser. No. 611,309
Int. Cl.[4] B66C *23/00*
U.S. Cl. 414—723 **1 Claim**



1. A quick coupler assembly for attaching a material handling bucket to the free ends of lift arms extending from a tractor loader, said quick coupler assembly including an elongated cross member having hitch members mounted on its opposite ends with the assembly being pivotally attached to said lift arms, means for rotating said coupler assembly forwardly and rearwardly relative to said lift arms, an upper coupling member that extends outwardly from a rear wall on said bucket near the top edge thereof and a lower coupling member that extends outwardly from said bucket rear wall near the bottom edge thereof, each hitch member including an upper attachment member which is rotated into engagement against said upper coupling member, the opposite end of each hitch member including a lower attachment member for mating engagement with said lower coupling member, said lower attachment member and lower coupling member including openings which are movable into an aligned relationship, said coupler assembly further including an over-center latching mechanism operatively associated with each hitch member, said over-center latching mechanism including a handle pivotally connected to a respective hitch member and to one end of

a link, said link being pivotally attached to one end of a slidably movable shaft member having a wedge locking member on the opposite end thereof, and said quick coupler assembly being movable into a first position wherein each hitch bracket upper attachment member is brought into engagement against the underside of a respective bucket upper coupling member and a second position wherein each said lower attachment member is brought into engagement with said lower bucket coupling member such that said lower attachment member and lower coupling member openings become aligned, and said quick coupler assembly being movable rearwardly by said means for rotating said coupler assembly from said second position such that said handle engages a stop member on said tractor loader for pushing said handle and pivotally attached link over-center thereby slidably forcing said wedge member through said openings for securely attaching said bucket to said coupler assembly.

4,545,721

COMBINED LIFT FORK AND BUCKET DEVICE FOR ATTACHMENT TO A VEHICLE

Stig Pettersson, Västtjärn 750, S-825 00 Iggesund, Sweden

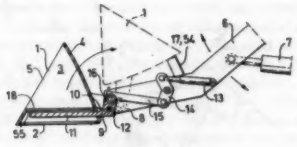
PCT No. PCT/SE83/00178, § 371 Date Jan. 3, 1984, § 102(e) Date Jan. 3, 1984, PCT Pub. No. WO83/04062, PCT Pub. Date Nov. 24, 1983

PCT Filed May 4, 1983, Ser. No. 590,588

Claims priority, application Sweden, May 7, 1982, 8202897; Apr. 7, 1983, 8301933

Int. Cl.⁴ B66F *9/16*

U.S. Cl. 414—724 **13 Claims**



1. A device comprising a combined assembly of a lifting fork and bucket, which is intended to be attached to a vehicle, said assembly being carried by means of lifting arms extending parallel to each other, and wherein means including hydraulic means are provided for controlling said lifting arms and said bucket so that at least the forward portion of the bucket can be lifted and lowered in a substantially vertical plane and be tipped, wherein a lifting fork is carried by said lifting arms, said lifting fork being pivotable by a further hydraulic means so that the arms of said fork can be pivoted in planes substantially perpendicular to the width direction of said bucket, said fork being located substantially beneath said bucket and wherein at least said portion of the bucket is enabled by said hydraulic means to be folded to and from the fork between a first and a second position whereby the bucket, in said first position rests on the fork, and in the said second position is folded up away from said fork and back substantially completely away from the vertical zone above the fork arms so that said fork can be utilized in the conventional manner.

4,545,722

FLEXIBLE ROBOT GRIPPER FOR IRREGULAR SHAPES

Mark R. Cutkosky, and Eiki Kurokawa, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 4, 1983, Ser. No. 491,479

Int. Cl.⁴ B66C *1/00*

U.S. Cl. 414—730 **13 Claims**

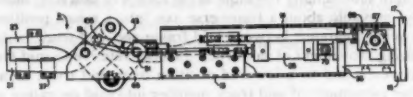
1. An end-effector comprising:

a structural frame means having at one end thereof mounting means for establishing an interface with an industrial manipulator and a first fixed axis proximate the other end thereof;

first gripper means rotatable about said first fixed axis;

second gripper means rotatable about said first fixed axis;

single actuating means for effecting the rotational movement of said first and second gripper means about said first fixed axis relative to each other; and



brake means operably associated with said first gripper means for positively locking said first gripper means in a fixed position relative to said first fixed axis, such that said single actuating means now effects the rotational movement of said second gripper means about said first fixed axis and relative to said locked first gripper means.

4,545,723

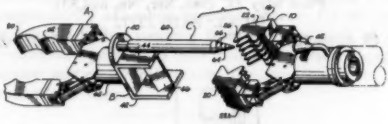
APPARATUS FOR ADAPTING AN END EFFECTOR DEVICE REMOTELY CONTROLLED MANIPULATOR ARM

Keith H. Clark, Decatur, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 538,063

Int. Cl.⁴ B25J *15/04*

U.S. Cl. 414—730 **16 Claims**



1. Apparatus for adapting a general purpose end effector device carried at a free end of a remotely controlled mechanical manipulator arm to a special purpose end effector device, said apparatus comprising:

(a) said general purpose end effector device including first and second pivotable jaws disposed in spaced opposed relation;

(b) first and second channel notches formed in said first and second jaws defined by planar intersecting edges intersecting one another at defined sharp angles;

(c) said first and second channel notches forming a closed channel when said first and second jaws are closed together having a four-sided generally diamond-shaped configuration;

(d) said special purpose end effector device comprising an end effector device for performing a specialized task;

(e) an adapter bracket assembly for electrically and mechanically connecting said special purpose end effector to said general purpose end effector comprising:

(i) an adapter bracket having a base plate on which said special purpose end effector is carried,

(ii) first and second spaced containment webs extending from said base plate,

(iii) a connecting post extending between said first and second containment webs spaced from said base plate,

(iv) said post having surfaces intersecting each other at complementary angles corresponding to the angles of intersection of said surface of said closed channel when gripped by said jaws to prevent relative rotation between said special and general purpose end effector when connected together, and

(v) said first and second containment web means containing said gripping jaws to effectively prevent relative

vertical movement between said special purpose and general purpose end effector devices,

whereby said special purpose and general purpose end effector devices are connected mechanically together as one piece;

(f) a first self-aligning electrical connector component carried by said adapter bracket assembly for delivering electrical transmissions to said special purpose end effector; and

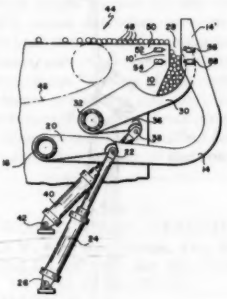
(g) a second self-aligning electrical connector carried by said general purpose end effector which self-aligns and connects with said first connector component when said end effector devices are mechanically connected together by said adapter bracket, said second connector component adapted for connection to a source of said electrical transmissions.

4,545,724

APPARATUS FOR ASSEMBLING ELONGATED ELEMENTS

Kenneth L. Klusmier, Worcester, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Apr. 27, 1983, Ser. No. 489,218
Int. Cl.[4] B65B *13/20*
U.S. Cl. 414—745 **7 Claims**



1. Apparatus for assembling tubes, bars, rods and other like elongated elements preparatory to bundling the same, said apparatus comprising:

stationary members arranged to define one side of an assembly zone;

first pivotal members associated with said stationary members, said first pivotal members, when in raised positions, being arranged to define the opposite side of said assembly zone, with the upper ends of both said stationary members and said raised first pivotal members being shaped to define a guide path therebetween leading downwardly to said assembly zone, the width of said guide path being relatively narrow in comparison to that of said assembly zone;

first operating means for pivotally adjusting said first pivotal members between their raised positions and lowered discharge positions accommodating the removal of accumulated elongated elements from said assembly zone;

conveyor means for laterally transporting and dropping elongated elements through said guide path into said assembly zone;

second pivotal members extending transversally across said assembly zone, said second pivotal members being arranged to support the elongated elements received from above through said guide path and to cooperate with said stationary members and said first pivotal members in containing the thus received elongated elements in said assembly zone;

second operating means for pivotally manipulating said second pivotal members between raised positions adjacent to the lower end of said path and lowered positions also accommodating the removal of accumulated elements from said zone; and

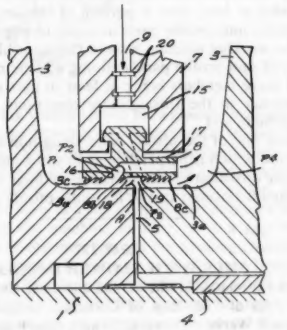
control means associated with said second operating means for effecting a progressive lowering of said second pivotal members during accumulation of elongated elements in said assembly zone in order to control the distance through which said elements are permitted to drop from said conveyor means.

4,545,725

STRESS CORROSION CRACKING PROOF STEAM TURBINE

Takashi Ikeda, Tokyo, and Masachika Odawara, Kanagawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 18, 1984, Ser. No. 571,796
Claims priority, application Japan, Jan. 24, 1983, 58-9645
Int. Cl.[4] F01D *5/08, 25/12*
U.S. Cl. 415—180 **12 Claims**



1. A stress corrosion cracking proof steam turbine comprising:

a casing;

a rotor shaft provided through said casing;

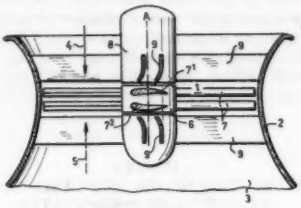
a plurality of discs fitted on said rotor shaft each disc having a hub portion with gaps between the hub portions of adjacent discs, and an inter-disc space between adjacent disc; and

a nozzle diaphragm having a nozzle, and mounted within an inter-disc space, said diaphragm including a labyrinthine packing having a plurality of fins, the packing being mounted on an inside circumferential face of said nozzle diaphragm, also including a steam supply passage provided through said nozzle diaphragm for supplying steam that has been converted into a dry state from the interior or the exterior of the turbine into a region between said hubs and said labyrinthine packing, and a steam leakage bypass whereby steam leakage that flow down between group of upstream fins of labyrinthine packing and said hub is conducted away from said gap betweeen hub portions of adjacent discs, thereby preventing corrosion at an interface between hub and rotor.

4,545,726
TURBINE

Karl Holliger, Zürich, Switzerland, assignor to Sulzer-Escher Wyss Ltd., Zürich, Switzerland

Filed May 19, 1982, Ser. No. 379,630
Claims priority, application Switzerland, Jun. 5, 1981, 3706/81
Int. Cl.[4] F03B 13/12
U.S. Cl. 415—26 16 Claims

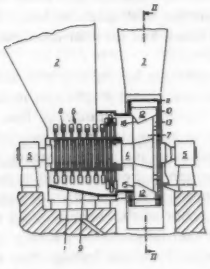


1. A turbine comprising:
a rotatable rotor provided with a rotor hub and rotor blades each having a profiled structure defining a substantially aerofoil-shaped profile;
a working medium alternately flowing through the rotor in opposite throughflow directions;
said rotor rotating in the same direction of rotation during both throughflow directions of the working medium;
the profiled structure of each of the rotor blades being subdivided at least over a portion of the length of the rotor blades into profile parts in order to improve the flow of the working medium around the rotor blades;
each of said profile parts defining a blade member;
said blade members being at least in part spaced from one another in the throughflow directions of the working medium; and
at least one of the profile parts being non-symmetrical to a plane which is perpendicular to the momentary throughflow direction of the working medium and which plane extends through said at least one profile part.

4,545,727
MILL WITH BLOWER IMPELLER

Richard Beelmann, Mülheim, and Johannes Kerstges, Oberhausen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 435,091
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142042
Int. Cl.[4] B02C 13/10
U.S. Cl. 415—206 1 Claim

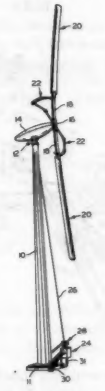


1. A mill comprising: an impeller; an axial inlet with a cross-section, and a radial outlet; blades mounted between two disks, each blade having a leading edge projecting into the cross-section of said inlet; the leading edge of every other one of said blades being perpendicular to the axis of the impeller and the leading edge of the remaining blades on said impeller being skewed; said blades on said impeller alternating in sequence along the circumference of said impeller so that each blade with leading edge perpendicular to the impeller axis is adjacently neighbored on each side with blades having skewed leading edges; the alternating sequence of said blades reducing wear on said blades by a predetermined amount for increasing the operating life of the blades; a casing surrounding said impeller; said sequence of blades also distributing dust material substantially uniformly onto said casing for uniform wear of said casing.

4,545,728
WIND TURBINE GENERATOR WITH IMPROVED OPERATING SUBASSEMBLIES

Marvin C. Cheney, Jr., 24 Stonepost Rd., Glastonbury, Conn. 06033

Filed Aug. 30, 1983, Ser. No. 528,054
Int. Cl.[4] F03D 7/04
U.S. Cl. 416—11 17 Claims



1. In a wind turbine, the combination comprising:
A. a tower having a passage extending downwardly therethrough;
B. a nacelle at the top of said tower;
C. bearing means supporting said nacelle on the top of said tower for rotation about a vertical axis;
D. a rotor shaft rotatably supported in said nacelle for rotation about a horizontal axis;
E. a rotor on one end of said rotor shaft and including flexible beam means extending diametrically from said shaft, and flexible blades supported on the outer ends of said beam means;
F. generator means in said nacelle operatively driven by said rotor shaft for generating electrical power;
G. cable means extending downwardly from said nacelle through said passage in said tower;
H. yaw spring means in said tower operatively connected between said nacelle and tower and tensioned by rotation of said nacelle on said tower in response to yawing caused by change in wind direction, said spring means limiting the rotation of said nacelle in one direction and rotating said nacelle in the opposite direction to the untensioned position of said spring means upon termination of the wind force producing the yawing, said cable means twisting in said tower during said tensioning of said spring as a result of said yawing;

I. rotor backstop means in said nacelle including stop shoulder means on said rotor shaft and stop means engageable therewith to limit movement of the rotor shaft in the direction opposite the normal direction of rotation and thereby position said rotor with the blades substantially vertical during periods in which said rotor is upwind at the time wind flow commences;

J. negative coning restraining means on said rotor including relatively rigid arm members extending outwardly from said rotor shaft along the surface of said flexible beam means adjacent said nacelle and providing at the outer end thereof an abutment surface to limit flexure of said flexible beam means toward said nacelle;

K. blade pitch control means including pendulum support means extending diametrically outwardly from said rotor shaft at an angle to the longitudinal axis of said flexible beam means, pendulum members pivoted at one end to the outer ends of said support means, and flexible straps connected between the other ends of said pendulum members and said flexible beam means to effect torsional twisting of said beam means during rotation of said rotor and thereby maintain the pitch angle of said blades at approximately 0° throughout the normal operating range of the turbine, the axis of the pivoting between said one end of said pendulum members and said support means being angularly offset from the plane of rotation of said support means; and

L. creep control means for said flexible beam means comprising cable means extending between said pendulum members to limit the extent of pivoting thereof relative to the longitudinal axes of said pendulum support means and thereby the torsional twisting of said beam support means and shear means connecting said cable means and pendulum members for shearing said connection under excessive speed conditions of said rotor to effect further twisting of said blades and effect stalling of said rotor.

4,545,729

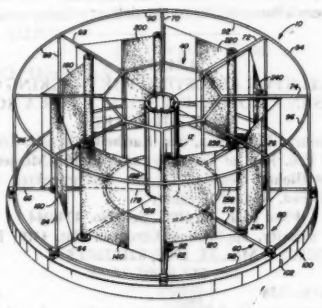
WIND TURBINE APPARATUS

Joe Storm, 1105 W. Elna Rae, Tempe, Ariz. 85281

Filed Jul. 28, 1983, Ser. No. 518,047

Int. Cl.⁴ F03D *7/06*

U.S. Cl. 416—132 B **29 Claims**



1. Wind turbine apparatus, comprising, in combination:

frame means rotatable in response to wind;

sail means, including a plurality of sails secured to the frame means for receiving the wind and adapted to impart rotary motion to the frame means;

roller means for furling and unfurling the sails;

control means for controlling the furling and unfurling of the sails, including

weight means movable upwardly and downwardly,

upper control cable means secured to the weight means and to the sails and adapted to move the weight means upwardly in response to movement of the sails away from a predetermined neutral position in response to the wind, and

lower control cable means secured to the weight means and to the roller means and adapted to furl the sails by movement of the roller means in response to the upward movement of the weight means.

4,545,730

LIQUID RING VACUUM PUMP FOR GASEOUS MEDIA

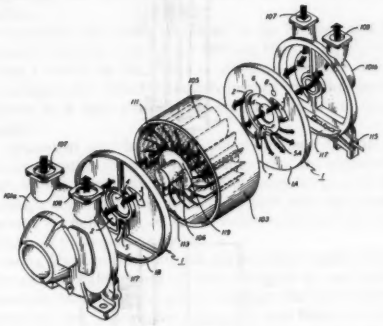
Wilfried Lübke, Ammerndorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 389,893, Jun. 18, 1982, abandoned. This application Jul. 9, 1984, Ser. No. 628,959

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124867

Int. Cl.⁴ F04C *19/00*

U.S. Cl. 417—68 **5 Claims**



1. In a liquid ring vacuum pump for a gaseous medium which includes a machine housing which surrounds an impeller eccentrically and is closed off at the end face by end bells for the impeller shaft, at least one end bell having a separate inlet and outlet for the medium, which are in communication, via suction and pressure slots in a flat control disc disposed between the end bell and the machine housing, with a gap between blade chambers of the impeller and the housing closed off on the circumference by a liquid ring, a pressurized liquid canal being provided in the respective control disc, said canal connected to a pressurized liquid feed line and aligned with the inlet to a pressurized liquid passage in the control disc, which is arranged below the shaft passage of the control disc at the end face facing the impeller hub, so that the pressurized liquid flows off into the liquid ring, sealing the gap, the improvement comprising the control disc having on the side facing the impeller at least one inflow channel located between the suction slot and the pressure slot as seen in the direction of rotation of the impeller, and below the shaft passage, said inflow channel extending radially over the region of the impeller hub up to the region of the blade chambers and being connected to the pressurized liquid passage; and a sump, the pressurized liquid feed line connected to the pressurized liquid canal in the control disc through said sump.

4,545,731

METHOD AND APPARATUS FOR PRODUCING A WELL

Carlos R. Canalizo, Dallas, and James M. Hays, Allen, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

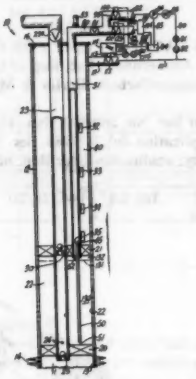
Filed Feb. 3, 1984, Ser. No. 576,854

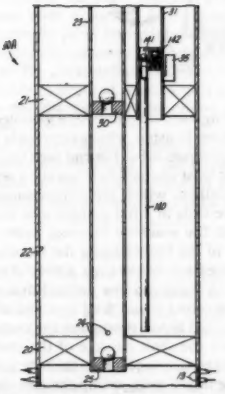
Int. Cl.⁴ F04B *23/14;* **F04F** *1/08, 1/20*

U.S. Cl. 417—86 **9 Claims**

1. A system for producing fluids from an earth formation through a well comprising: a production chamber in said well communicating with said earth formation; means for flow of fluids under formation pressure from said earth formation into

said production chamber; a production tubing string in said well extending into commuication with said production chamber; a power fluid tubing string in said well opening at a lower end into the upper end of said production chamber; a lift gas chamber along said well around said power fluid tubing string; gas lift valves connected in spaced relation along said power





fluid tubing string to admit lift gas to said power fluid tubing string from said lift gas chamber; and means connected with the lowermost gas lift valve and lower end of said power fluid tubing string to direct lift gas from said lowermost gas lift valve into said production chamber to displace power fluid from said production chamber into said power fluid tubing string.

4,545,732

RADIAL PISTON PUMP WITH A STAR-SHAPED CONNECTING PIECE

Guido Oberdorfer, Guido-Oberdorfer-Strasse 2-8, Bellenberg, Fed. Rep. of Germany (7919)

Filed Jul. 8, 1983, Ser. No. 512,433

Claims priority, application Switzerland, Jul. 15, 1982, 4295/82

Int. Cl.⁴ F04B *1/04, 49/00*

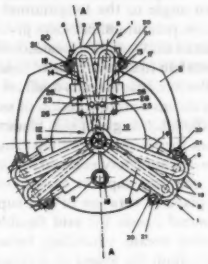
U.S. Cl. 417—273 **9 Claims**

1. A radial piston pump with at least two cylinders (1), comprising: a suction valve (8) and a delivery valve (9) mounted as a pair to each of the cylinders (1) such that all valves are similarly mounted on the same side of respective cylinders (1);

a suction line and a delivery line;

a set of suction channels (13), disposed within pipes (17), connecting the suction line to each of the suction valves (8);

a set of delivery channels (14), disposed within pipes (18), connecting each of the delivery valves (9) to the delivery line, said pipes (17, 18) having outer end parts, including an external flange (19), and each of said cylinders having an external surface, including an external flange (7), wherein said sets of channels are arranged concentrically on the side of said cylinders to which said valves are mounted, and wherein each valve (8, 9) is clamped be-



tween and has end surfaces which abut against said external flanges (7, 19), such that a pair of channels comprising a suction channel and a delivery channel is connected to each cylinder, said channels being connected firmly to one another in a central region, and wherein

the suction channels (13) and the delivery channels (14) extend in a connecting piece (12) in the form of a star in a manner corresponding to the arrangement of the cylinders (1), one end of each of the suction channels (13) opens into a cavity (15) in the connecting piece (12) to which said suction line is connected, the delivery channels (14) are in fluid connection with one another in a central region of the connecting piece (12), and one of the delivery channels (14) has a through-orifice (23) for connecting the delivery channels (14) to the delivery line.

4,545,733

APPARATUS FOR ADJUSTING THE TRACKING OF THE BLADES IN A ROTOR, ESPECIALLY FOR A ROTARY WING AIRCRAFT

Alois Schwarz, Putzbrunn, and Karlheinz Mautz, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 474,044

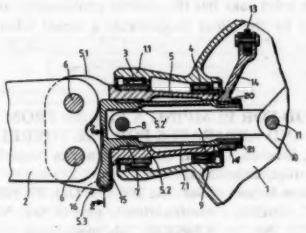
Claims priority, application European Pat. Off., Mar. 18, 1982, 82102202.7; Mar. 18, 1982, 82102203.5

Int. Cl.⁴ B64C *27/48*

U.S. Cl. 416—138 **6 Claims**

1. An apparatus for adjusting the tracking of a plurality of blades in a rotor, especially for a rotary wing aircraft, comprising a hollow rotor hub (1) defining a rotational axis and including a central hub body (10) and a hollow rotor hub arm (1.1) for each blade, said hollow rotor hub arms extending radially relative to said rotational axis, each of said blades having a longitudinal blade axis extending radially relative to said rotational axis, each blade further comprising a blade root and a blade root sleeve (5) connected to said blade root and extending through its respective one of said rotor hub arms, bearing means (3, 4) rotatably supporting said blade root sleeve (5) in its rotor hub arm (1.1), first blade angle adjustment means (7, 7.1) extending rotatably through said blade root sleeve into said hub, axially effective arresting means (5.2, 5.2') between

said blade root sleeve (5) and said first blade angle adjustment means (7, 7.1) for restraining relative axial movement between said blade root sleeve and said first blade angle adjustment means, tension means (9) yielding to torsional loads securing said first blade angle adjustment means to said central hub body (10) for locking said blade to said rotor hub against centrifugal forces but permitting blade adjustments about said longitudinal blade axis inside said blade root sleeve (5), second blade angle adjustment means (13, 14) operatively located in said hollow hub (1) and including means operatively connecting said second blade angle adjustment means to said first blade angle adjustment means inside said hollow rotor hub, said first blade angle adjustment means (7, 7.1) comprising a radially outer end extending out of said blade root sleeve (5) and an adjustment lever arm (15) connected to said radially outer end, said apparatus further comprising adjustable locking means (16) operatively interposed between said adjustment lever arm (15) and said blade root for permitting a rotational adjustment of said first blade angle adjustment means by rotating said adjustment lever arm and then locking said adjustment lever arm in an adjusted position.



4,545,734

AXIAL FLOW MACHINE, PARTICULARLY A BLOWER, WITH ADJUSTABLE ROTOR BLADES

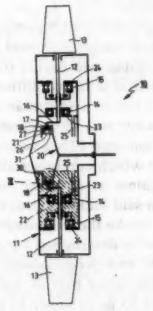
Hans Schilder, Zweibrücken, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,960

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227071

Int. Cl.[4] **F04D** *29/06*

U.S. Cl. 416—146 A **12 Claims**



1. An axial flow machine, comprising:

a closed housing adapted for containing an oil supply and rotatable about an axis;

a plurality of rotor blades located outside and arrayed around the housing and the axis and a respective strut for supporting each blade and the strut extending from the blade into the housing toward the the axis; the struts and blades rotating with the housing;

a respective swing lever attached to each strut; the swing lever being offset from the strut and being movable axially of the housing for rotating the strut about the axis of the strut, for adjusting the orientation of the blade that is supported on the strut, with respect to the housing;

a respective slide block located on the swing lever, and the swing lever including a pin rotatable in and with respect to the slide block therefore, each swing lever pin having a surface inside the respective slide block;

an adjustment part in the housing and rotatable therewith; the adjustment part having a solid body of rotational symmetry and including a rim having an annular peripheral groove therearound and a side which is radially inward from the annular groove; the slide blocks of the swing levers being disposed in the groove; each swing lever pin having a side facing into the groove; the adjustment part being displaceable axially in the housing for displacing the slide blocks axially for reorienting the blades;

the adjustment part being so placed in the housing and the housing being so shaped for holding the oil supply that when rotation of the rotor is stopped, the side of the adjustment part which is radially inward from the annular groove is at least partially covered by the oil in the oil supply;

the adjustment part having oil outlets defined therein for communicating from the side of the rim of the adjustment part which is radially inward of the annular groove and through the rim of the adjustment part into the annular groove for delivering oil to the swing lever pins and slide blocks in the annular groove;

the swing lever pins having oil transmitting means defined therein for transmitting oil from the side of each swing lever pin facing into the groove to the surface of the swing lever pin that is inside the respective slide block for lubricating the rotation of the swing lever pin in its slide block.

4,545,735

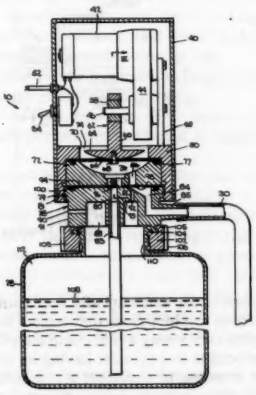
DIAPHRAGM PUMP HAVING A VALVE SHEET WITH INLET AND OUTLET FLAPS AND HAVING ANTISIPHONING CAPABILITY DURING PUMP SHUTDOWN

Horst O. H. Ims, Waterloo, Canada, assignor to Uniroyal, Ltd., Don Mills, Canada

Filed Aug. 17, 1984, Ser. No. 642,290

Int. Cl.[4] **F04B** *49/00, 21/02;* **F16K** *24/00*

U.S. Cl. 417—307 **14 Claims**



1. A pump for use with a fluid reservoir container, said pump

comprising, a pumping chamber, fluid intake means for directing fluid into said pumping chamber, fluid discharge means for directing fluid out of said pumping chamber, flexible diaphragm means at said pumping chamber deflectable in a first direction to draw fluid through said fluid intake means into said pumping chamber and deflectable in a second direction to expel fluid from said pumping chamber through said fluid discharge means, reciprocating means communicable with said diaphragm means for moving said diaphragm means in said first and second directions, an inlet valve disposed across said fluid intake means and an outlet valve disposed across said fluid discharge means, an air chamber in said pump in communication with the fluid in said container and having vent means for venting said air chamber at the atmosphere, a bleed hole for permitting communication between said fluid discharge means and said air chamber, said inlet and outlet valves being deflectable such that movement of said flexible diaphragm means in said first direction causes movement of said inlet valve to a fully open position to permit drawing of fluid into said pumping chamber and movement of said outlet valve to a fully closed position to prevent reverse flow from said fluid discharge means to said pumping chamber, and movement of said flexible diaphragm means in said second direction causes movement of said inlet valve to a fully closed position to prevent reverse flow of said fluid from said pumping chamber back to said fluid intake means and, during normal operation of the pump with the fluid discharge means in an unblocked condition, causes movement of said outlet valve to a fully open position to permit discharge of fluid from said pumping chamber to said fluid discharge means, said outlet valve in said fully open position closing said bleed hole and interrupting communication between said fluid discharge means and said air chamber.

4,545,736

APPARATUS FOR AUTOMATICALLY PROCESSING SLURRY

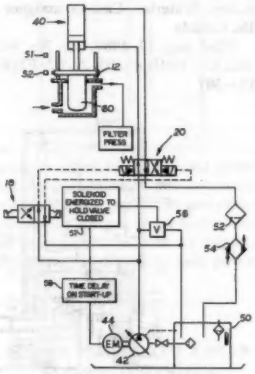
Francis R. Walton, Longton, England, assignor to Thomas Willett & Co. Ltd., Stoke-on-Trent, England

Filed May 27, 1983, Ser. No. 498,941

Claims priority, application United Kingdom, Jun. 9, 1982, 8216765

Int. Cl.[4] F04B *9/10*

U.S. Cl. 417—63 **9 Claims**



1. Apparatus for automatically processing slurry in a treatment cycle to produce from the slurry a solid cake of desired consistency, comprising a ram pump including a ram mounted for reciprocation in a cylinder having an inlet for admission of slurry in response to a suction stroke and an outlet for discharge of slurry in response to a delivery stroke of the ram, a processing receiver connected to receive slurry from said outlet, for separating liquid from the slurry under pressure to form a solid cake, a hydraulic cylinder having a piston connected to reciprocate the ram, an electrical means for sensing arrival of the ram at each of its limiting positions, and means responsive to such electrical sensing means for controlling the hydraulic cylinder and piston to reverse the movement of the ram at each of its limiting positions, wherein the improvement comprises a timer which is restarted by at least one of the electrical sensing means, to measure the duration of the delivery stroke of the ram, a device which presets the timer to time out when the duration of the delivery stroke of the ram indicates that the treatment cycle has reached an end point at which the solid cake has the desired consistency, and a device controlled by the timer to generate a signal when the timer times out.

4,545,737

METHOD FOR PUMPING A LIQUID FROM A WELL AND APPARATUS FOR USE THEREIN

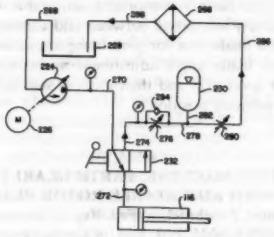
George E. Stanton, Orient, Ohio, assignor to Nujack Oil Pump Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 200,899, Oct. 27, 1980, Pat. No. 4,406,597, which is a continuation-in-part of Ser. No. 156,780, Jun. 5, 1980, Pat. No. 4,346,620. This application Aug. 11, 1982, Ser. No. 407,268

The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.

Int. Cl.[4] F04B *47/04*

U.S. Cl. 417—53 **12 Claims**



1. In a method for pumping a liquid from a well, which comprises:

providing in said well a pump having a movable member capable of reciprocation so as to force said liquid from said well and a sucker rod having its lower end attached to said movable member;

providing adjacent said well a pump jack connected to the upper end of said sucker rod, said pump jack incorporating means for lifting said sucker rod;

lifting said sucker rod with said lifting means, thereby causing said sucker rod to undergo an upward stroke; and

allowing said sucker rod to descend, thereby causing said sucker rod to undergo a downward stroke;

the improvement which comprises allowing said sucker rod to descend against a resistance under the gravitational force acting on said sucker rod so that at the beginning of its downward stroke the magnitude of the acceleration of said sucker rod is determined by the gravitational force acting thereon, and progressively increasing said resistance during the latter part of said downward stroke of said sucker rod so as to apply to said sucker rod an upwardly-directed force greater than the gravitational force acting thereon, thereby causing a reduction in the rate of descent of said sucker rod to a minimum value before said sucker rod reaches the end of its downward stroke, the rate of descent of said sucker rod after attaining said minimum value being not less than said minimum value but not exceeding about 20 percent of the maximum rate of de-

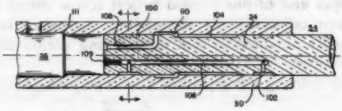
scent of said sucker rod prior to attaining said minimum value.

4,545,738

LINEAR MOTOR COMPRESSOR WITH CLEARANCE SEALS AND GAS BEARINGS

Niels O. Young, Free Union, Va., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Feb. 3, 1984, Ser. No. 576,815
Int. Cl.[4] F04B *39/00*; F01B *31/00*
U.S. Cl. 417—53 **16 Claims**



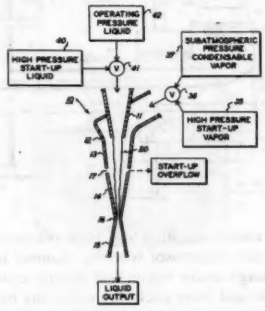
1. A reciprocating piston assembly comprising:
a piston positioned for axial movement within a sleeve with a working volume of gas at one end thereof;
a gas storage reservoir positioned within said piston;
a cutback in the surface of the sleeve which provides fluid communication between the working volume of gas and the gas storage reservoir only when the piston is at one end of its stoke;
a recess on the circumferential surface of said piston in fluid communication with a second reservoir of gas; and
a gas bearing formed between the piston and the sleeve by gas flow between the recess and the gas storage reservoir.

4,545,739

START-UP FOR HYDROKINETIC AMPLIFIER

Carl D. Nicodemus, Caledonia, N.Y., assignor to Helios Research Corp., Mumford, N.Y.

Continuation-in-part of Ser. No. 517,821, Jul. 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 236,918, Feb. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 42,967, May 29, 1979, abandoned. This application Oct. 3, 1983, Ser. No. 538,148
Int. Cl.[4] F04F *9/00*
U.S. Cl. 417—152 **8 Claims**



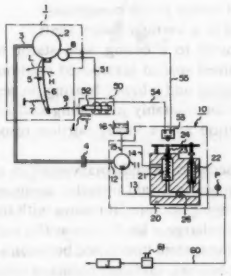
1. A method of starting a hydrokinetic amplifier powered by operating vapor at subatmospheric pressure, said hydrokinetic amplifier having a suction chamber with an input region and a discharge region, a liquid input nozzle arranged in said input region for directing a free liquid jet into said suction chamber, a vapor input nozzle arranged in said input region for directing a vapor into said suction chamber to surround and impinge on said liquid jet, and a converging amplifier nozzle and a diverging diffuser arranged downstream of said suction chamber, said starting method comprising:
a. connecting an evacuated region to said discharge region of said suction chamber while said suction chamber is in communication with a source of said subatmospheric pressure operating vapor so that vapor flows through said vapor input nozzle and into said suction chamber;
b. admitting liquid to said liquid input nozzle to form said free liquid jet extending through said suction chamber while said operating vapor is flowing into said suction chamber so that vapor impinges on and condenses in said liquid jet; and
c. disconnecting said evacuated region from said suction chamber once said condensing vapor produces a pressure in said suction chamber lower than the subatmospheric pressure of said operating vapor.

4,545,740

AUTOMATIC OPERATING SYSTEM FOR PUMP DRIVEN BY INTERNAL COMBUSTION ENGINE

Kenji Nishikiori, and Naomitsu Ozawa, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Sep. 20, 1984, Ser. No. 652,576
Int. Cl.[4] F04B *9/00, 17/00*
U.S. Cl. 417—317 **3 Claims**



1. An automatic operating system for a pump driven by an internal combustion engine, said automatic operating system comprising:
(a) an engine assembly including said engine associated with an operating member for varying the rotational speed of said engine;
(b) a pump assembly including said pump and a valve block hydraulically coupled with each other through a discharge passage from said pump, said valve block including a safety valve acting on said discharge line;
(c) a centrifugal clutch which couples an output shaft of said engine to an input shaft to said pump;
(d) a discharge line lead from said valve block to a load to which hydraulically pressurized liquid is supplied therethrough; and
(e) a valve disposed in said discharge line and adapted to close and open said discharge line;
(f) said valve block including a pressure responsive valve body in said safety valve and a regulating plunger adapted to move together with said pressure responsive valve body to contact a microswitch when said valve in said discharge line is closed, the contact putting the microswitch in its "on" state, which causes said operating member to move to lower the engine speed to disconnect said clutch; and
(g) an arresting member arresting said plunger in a position to maintain said microswitch in its "on" state even when said valve body is returned to a position to close said safety valve until the valve in the discharge line is opened.

4,545,741

VERTICAL MOTOR PUMP

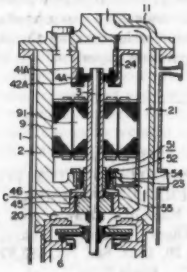
Shunzoo Tomioka; Masaaki Nakano; Kinpei Okano; Kousaku Shimizu, all of Hitachi, and Hiroaki Yoda, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1983, Ser. No. 492,641

Claims priority, application Japan, May 7, 1982, 57-75427

Int. Cl.⁴ F04B *39/02;* **F01D** *25/16*

U.S. Cl. 417—365 **2 Claims**



1. A vertical motor pump comprising:

a rotor fitted to a vertical rotary shaft;

a stator secured to a casing, said stator being located in predetermined spaced juxtaposed relation to said rotor;

an upper bearing and a lower bearing on respective sides of said rotor for rotatably journaling said rotary shaft at an upper portion and a lower portion respectively of said rotor;

an impeller secured to said rotary shaft in a position below said lower bearing, said impeller being operative to perform a pumping action as it rotates with the rotary shaft as a unit to discharge a liquid upwardly; and

a load reducing system interposed between said impeller and said lower bearing, said load reducing system being operative to reduce a pump thrust generated when the motor pump is operated;

wherein one of said upper bearing and said lower bearing is constituted by a ball bearing, and a slide bearing is mounted on an outer periphery of a bearing case containing said ball bearing to allow said ball bearing to follow up the rotary shaft in vertical movement, and said rotary shaft is journaled, besides being journaled by said ball bearing, by a hydrostatic lubricated bearing system for bearing a radial load during operation.

4,545,742

VERTICAL AXIS HERMETIC HELICAL SCREW ROTARY COMPRESSOR WITH DISCHARGE GAS OIL MIST ELIMINATOR AND DUAL TRANSFER TUBE MANIFOLD FOR SUPPLYING LIQUID REFRIGERANT AND REFRIGERANT VAPOR TO THE COMPRESSION AREA

Donald D. Schaefer, Farmington, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Division of Ser. No. 430,218, Sep. 30, 1982, Pat. No. 4,477,233. This application Jun. 11, 1984, Ser. No. 619,237

Int. Cl.⁴ F04B *39/02, 39/06;* **F04C** *18/107;* **F25B** *41/00*

U.S. Cl. 417—366 **2 Claims**

1. In a vertical axis hermetic helical screw rotary compressor comprising:

a closed vertical axis cylindrical outer enclosure,

an inner cylindrical casing of a diameter less than that of said outer enclosure,

means for coaxially fixedly mounting said inner cylindrical casing within said outer enclosure, said inner cylindrical casing including transverse wall means separating said inner cylindrical casing into upper and lower chambers,

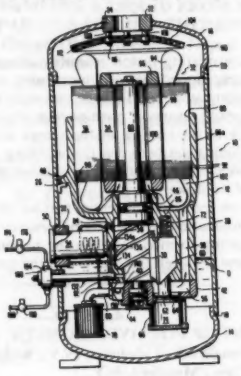
a pair of vertical axis, laterally intersecting bores formed within said inner casing,

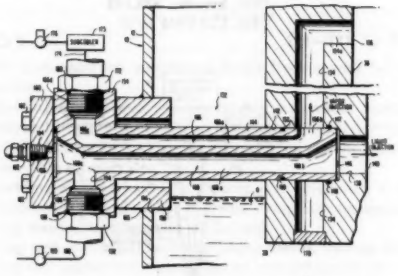
intermeshed helical screw rotors within respective bores and forming with the bores a compressor working chamber,

an inlet tube opening to said casing bores and said compression chamber at the upper end of said intermeshed helical screw rotors for supplying low pressure working fluid to said compressor,

an electrical drive motor, said motor including a stator and a rotor, said motor rotor being coaxially mounted to the upper end of one of said helical screw rotors and said stator concentrically surrounding said rotor and being fixedly mounted to said inner casing within said upper chamber,

means defining a compressor discharge passage within said





inner casing for directing high pressure discharge gas from said compressor working chamber upwardly,

fluid passage means within said electric drive motor rotor,

oil within said outer enclosure collecting by gravity within the bottom thereof which functions as an oil sump,

means for supplying oil to the rotating parts of the compressor from said sump at the discharge pressure of the compressor and being entrained in the compressor discharge such that;

oil separates from the working fluid by centrifugal force due to rotation of the drive motor rotor and falls by gravity back into the sump;

a liquid refrigerant injection port formed within said inner cylindrical casing and opening to said compressor working chamber,

a vapor injection port carried by said inner cylindrical cas-

ing and opening to said working chamber at a point displaced from the liquid refrigerant injection port,

said working fluid comprising a refrigerant, and

means for supplying liquid refrigerant at compressor discharge pressure to said liquid injection port, and for supplying refrigerant in vapor form at a pressure intermediate of the suction and discharge pressure of the compressor to said vapor injection port,

and wherein said supply means comprise separate lines for said liquid refrigerant and said vapor at intermediate pressure and includes control valves exterior of the cylindrical outer enclosure within the lines and acting to close off selectively supply lines leading to said liquid refrigerant injection port and said vapor injection port,

the improvement wherein;

said supply means comprises a dual transfer tube manifold assembly projecting inwardly of the cylindrical outer enclosure and being sealably and fixedly mounted thereto and spanning across the space between the cylindrical outer enclosure and the inner cylindrical casing and being of heat conductive material and bearing elongated parallel passages for said liquid refrigerant and said intermediate pressure vapor and being in fluid communication at their inboard ends with said liquid refrigerant injection port and said vapor injection port, respectively,

whereby, when the control valves of said supply means are closed, working fluid pulsing back and forth within one of said parallel passages may be cooled by continued flow of injection fluid within the other of said parallel passages to thereby prevent excessive heat build up within the supply means injection passages leading from the cylindrical outer enclosure,

and wherein, irrespective of injection fluid flow through said passages, said dual transfer tube assembly is cooled by drops of oil separated from the working fluid above the level of said dual transfer tube assembly and falling by gravity towards the accumulated oil within the sump and impacting on said dual transfer tube assembly.

4,545,743

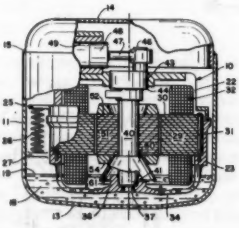
OIL STIRRER FOR REFRIGERATION COMPRESSOR

Robert W. Earley, Worthington, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Apr. 2, 1980, Ser. No. 136,679

Int. Cl.⁴ F04B *17/00, 35/00*

U.S. Cl. 417—372 **14 Claims**



1. A refrigeration compressor comprising a rigid outer shell, a motor compressor mounted within said shell and having a crankshaft mounted for rotation about a vertical axis, a body of lubricating oil within said shell below said motor compressor and having an upper surface extending in a plane perpendicular to said vertical axis, and an oil stirrer secured to said crankshaft to rotate therewith, said oil stirrer having a hub portion secured to said crankshaft and a rigid conical skirt extending outwardly and downwardly to terminate in an annular edge below said upper surface of said oil, said skirt being concentric with said vertical axis and having a smooth and imperforate wall, said skirt being formed of a non-metallic rigid plastic material whose surface is not wetted by said oil.

4,545,744

PERISTALTICALLY OPERATING ROLLER PUMP

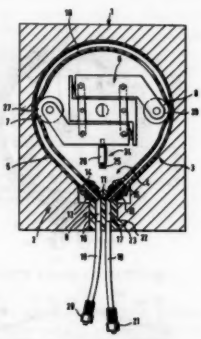
Wolfram Weber, Spiesen-Elversberg; Hans-Jürgen Neumann; Artur Meisberger, both of St. Wendel, and Bernd Mathieu, Spiesen-Elversberg, all of Fed. Rep. of Germany, assignors to Fresenius AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 24, 1984, Ser. No. 633,798

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1983, 3326784

Int. Cl.⁴ F04B *43/12, 45/08*

U.S. Cl. 417—475 **14 Claims**



1. Peristaltically operating roller pump comprising:

a pump bed;

a rotatably driven rotor carrying at its periphery rotatable rollers; and

a pump hose disposed between a pressure-side connection and a suction-side connection oriented radially outside the rollers along an inner bearing wall of the pump bed whereby in the region of the rollers the pump hose is pressed against the bearing wall and thereby occluded, the pressure-side connection and the suction-side connection being in immediate vicinity of each other and arranged to form said pump hose into a loop like arc combined in a common connecting piece which is releasably fixed in location at the pump bed, characterized in that the connecting piece is detachable from the pump bed and that the pump hose is immovably secured to the connecting piece to form a premade hose system.

4,545,745

PERISTALTIC PUMP

John R. Barreca, 532 Singletree Ct., Richland, Wash. 98352

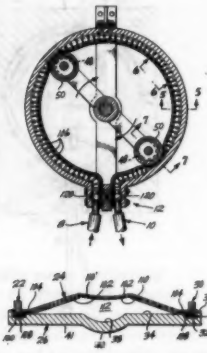
Continuation of Ser. No. 440,970, Nov. 12, 1982, abandoned. This application Dec. 14, 1984, Ser. No. 682,568

Int. Cl.⁴ F04B *43/12, 45/08*

U.S. Cl. 417—477 **19 Claims**

1. In a peristaltic pump, means including a pair of discrete and separable first and second members extending opposite one another and having yieldable biasing means operatively coextensively disposed opposite the bodies thereof to cause the members to separate from one another and define an elongated fluid flow path therebetween which has an inlet and an outlet spaced apart from one another lengthwise the line of flow thereof, and a third member which is movable lengthwise the line of flow of the path in engagement with the first member, the first and second members being displaceable by flexure and resistant to flexure, respectively, in those cross-sectional planes of the path transverse the line of flow thereof, and operatively interconnected with one another in the path defining condition thereof so that when the third member undergoes movement through the respective planes in the longitudinal direction of the line of flow relatively toward the outlet from the inlet, it displaces each longitudinally successive portion of the first

member in the direction opposed to the bias of the corresponding longitudinally successive portion of the biasing means operatively disposed thereopposite, to progressively constrict the cross-section of the path from plane to plane and drive the fluid along the path, and the biasing means being separate and detached from the bodies of the first and second members, externally thereof, so that the biasing means are operable to separate simultaneously all mutually opposing portions of the first and second members from one another over the entire length of the flow path from the inlet to the outlet thereof, but each of the respective portions of the biasing means is yieldable



to the displacement of the corresponding longitudinally successive portion of the first member operatively disposed thereopposite, independently of the remaining portions of the biasing means in the space between the inlet and the outlet, and operable thereafter, independently of the remaining portions of the biasing means, to restore the aforesaid corresponding portion of the first member thereopposite to the relatively undisplaced condition thereof when the third member has displaced the respective portion of the first member and moved on to the next successive portion in the aforesaid longitudinal direction of the line of flow.

4,545,746

ROTATION-PREVENTING DEVICE FOR AN ORBITING PISTON-TYPE FLUID DISPLACEMENT

Kazuo Sugimoto; Shigemi Shimizu, and Kiyoshi Terauchi, all of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

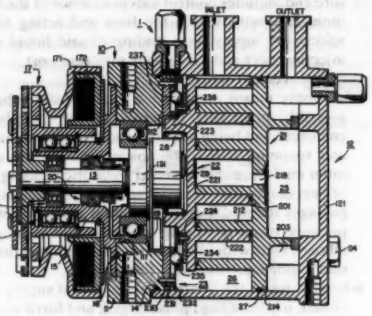
Filed Mar. 15, 1984, Ser. No. 589,753

Claims priority, application Japan, Mar. 15, 1983, 58-36344[U]

Int. Cl.⁴ F01C *1/04*; F16B *11/00*

U.S. Cl. 418—55 **7 Claims**

1. In an orbiting member fluid displacement apparatus including a housing, a fixed fluid displacement member attached to or integral with said housing, an orbiting member having an end plate from which an orbiting fluid displacement member extends, said fixed and orbiting fluid displacement members interfitting at a radial offset to make a line contact to separate a fluid outlet from a fluid inlet, a driving mechanism including a rotatable drive shaft connected to said orbiting member to drive said orbiting member in a orbital motion, rotation-preventing/thrust-bearing means connected to said orbiting member for preventing the rotation of said orbiting member and for carrying axial thrust load from said orbital member during orbital motion so that the line contact moves toward a discharge opening, said rotation-preventing/thrust-bearing means being comprised of a discrete orbital portion, a discrete fixed portion and bearing elements coupled between said portions, said orbital portion including an orbital annular race and an orbital ring placed within an annular groove formed in said end plate on an opposite side from which said orbiting fluid displacement member extends and fixed therein by a fasting device, said orbital ring having a plurality of first pockets extending axially toward said orbital race and being fixed to said orbiting fluid displacement member by caulking applied to an outer peripheral edge of said annular groove in said orbiting fluid displacement member, said fixed portion including a fixed annular race and a fixed ring placed within an annular groove formed in said housing and fixed therein by a fasting device, said fixed ring having a plurality of second pockets extending



axially toward said fixed race and being fixed to said housing by caulking applied to an inner peripheral edge of said annular groove in said housing, said bearing elements each being carried within generally aligned pairs of said first and second pockets and contacting said orbital and fixed races to prevent the rotation of said orbiting member by said bearing elements interacting with said orbital and fixed rings and to carry the axial thrust load from said orbiting member on said fixed race through said bearing elements.

4,545,747

SCROLL-TYPE COMPRESSOR

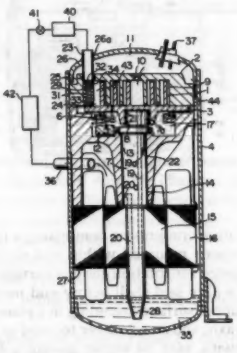
Takahiro Tamura; Hiroaki Kuno; Naoshi Uchikawa; Akira Murayama, and Takao Mizuno, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 559,089

Claims priority, application Japan, Dec. 17, 1982, 57-220065

Int. Cl.⁴ F04C *18/02, 29/08*

U.S. Cl. 418—55 **2 Claims**



1. A scroll-type compressor comprising an orbital scroll member and a stationary scroll member each having a disc-shaped end plate and a spiral wrap protruding upright from said end plate, said scroll members being assembled together with the wraps meshing with each other to define compression chambers therebetween, means for causing an orbital move-

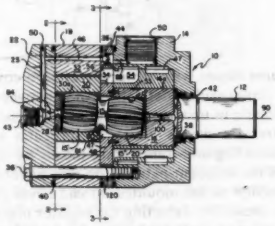
ment of said orbital scroll member without permitting said orbital scroll member to rotate around its own axis, a discharge port formed in a central portion and a suction port formed in a peripheral portion of said end plate of said stationary scroll member, whereby, as said orbital scroll member makes orbital movement, said compression chambers are moved towards the center while decreasing their volumes to thereby progressively compress a gas drawn through said suction port and to discharge the compressed gas through said discharge port, a gas passage means formed in a thickness of the end plate of said stationary scroll member for communication with a gas suction chamber formed between the scroll members, said gas passage means extending in an axial direction of said scroll members at a position where said gas passage means partially overlaps with a portion of said gas suction chamber near a wrap end portion of said spiral wrap of said stationary scroll member so that said gas passage means has an opening formed at a lateral side thereof for communication with said gas suction chamber, said opening having a width smaller than a width of said gas passage means and extending substantially over an entire height of said wraps, and a check valve means disposed in the gas passage means and including a valve plate resiliently urged for controlling a communication of said gas passage means with said gas suction chamber, said passage means being adapted to serve as a guide for allowing said valve plate to slide therein in an axial direction of said scroll members.

4,545,748

COMPACT HIGH TORQUE HYDRAULIC MOTORS

Carle A. Middlekauff, Cumberland, Me., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jul. 23, 1984, Ser. No. 633,270
Int. Cl.[4] F01C *1//113*
U.S. Cl. 418—61 B **10 Claims**



1. A hydraulic motor device comprising:

(a) a valve plate having a first and second planar face and rotatable about a central fixed axis, said valve plate having a plurality of control ports extending between the faces;

(b) a commutator having a plurality of alternate fluid inlet ports and fluid outlet ports, each facing the second planar face of the valve plate and adapted for fluid communication with the control ports on said rotary valve plate;

(c) a fluid displacement set adjacent the first face of the valve plate and having an inner gear member with external gear teeth which orbits about said fixed central axis and rotates about its own movable axis which is displaced from the fixed axis and a stationary outer gear member with internal gear teeth disposed concentric to said fixed axis and inactive portions provided between the external gear teeth of the inner gear member which inactive portions are not in contact with the internal gear teeth of the outer gear member during revolution of the inner gear member;

(d) variable volume chambers formed between the inner and outer members which are in direct fluid communication with the control ports on said valve plate; and

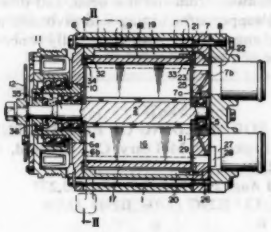
(e) an output shaft affixed to said rotary valve plate and driven to rotate about said fixed axis by said inner member to which it is connected by a universal coupling device.

4,545,749

VANE-TYPE ROTARY PUMP HAVING TWO-PIECE SIDE HOUSINGS

Hiroshi Sakamaki, Utsunomiya, and Yukio Horikoshi, Kazo, both of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 629,005
Claims priority, application Japan, Jul. 16, 1983, 58-128742
Int. Cl.[4] F04C *18/00, 29/00*
U.S. Cl. 418—173 **12 Claims**



1. A vane-type rotary pump comprising:

a central housing;

a rotor rotatably installed within said central housing, said rotor having a vane which is free to move into or out of said rotor; and

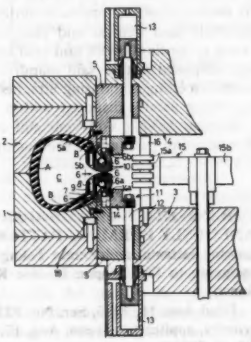
side housings flanking said central housing on both sides thereof, said side housings rotatably supporting said rotor by means of a bearing, said side housings having a light and strong construction and being composed of shaft housing parts for holding said bearing and side plate parts on the rotor side, said shaft housing parts being fabricated of a material selected from the group consisting of an iron base material and a whisker fiber composite material, said side plate parts being fabricated of a material selected from the group consisting of a light weight metal and a light weight metal alloy; and said shaft housing parts and said side plate parts being integrated together.

4,545,750

APPARATUS FOR VULCANIZING A TIRE

Kazumasa Sarumaru, 8-27 Kinmitsu-cho, Ashiya 659, Japan

Filed Feb. 13, 1984, Ser. No. 579,427
Claims priority, application Japan, Mar. 14, 1983, 58-44632
Int. Cl.[4] B29H *5/02*
U.S. Cl. 425—32 **10 Claims**



1. Apparatus for vulcanizing a tire, comprising a pair of generally annular split dies axially movable relative to each other, a pair of generally circular supports surrounded by said

dies, said supports including bead seats adapted to engage the axially outer sides of the tire beads so as to form a closed space between said supports and within the tire, said space being adapted to be supplied with a pressure medium and heated, said supports being axially movable relative to each other and to said dies, a plurality of members pivotally mounted on each of said supports adjacent said bead seats, each of said pivotable members including a plate movably mounted adjacent the free end thereof, and compression spring means for urging said plate against the associated tire bead annular tension spring means mounted on said pivotable members of each of said supports for urging said pivotable members to pivot into a retracted position away from the tire bead, and drive means provided on said supports for urging said pivotable members into compressive engagement with the axially inner sides of said tire beads on said bead seats.

4,545,751

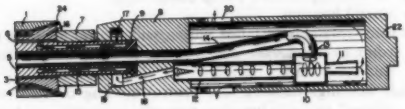
APPARATUS FOR MOLDING OF PLASTIC TUBING

Manfred A. A. Lupke, 10 McLeary Ct., Concord, Ontario, Canada (L4K 2Z3)

Filed Aug. 29, 1984, Ser. No. 645,277

Int. Cl.[4] B29C *17/07*; B29D *23/04*

U.S. Cl. 425—72 R **1 Claim**



1. An apparatus for molding of plastic tubing, including an elongate nozzle adapted for the attachment to an extrusion head for receiving an extrudate of an expandible plastic material under pressure therefrom, said nozzle providing a supply passage extending in the longitudinal direction thereof for the delivery of said extrudate to the delivery end thereof, a mandrel disposed in substantially coaxial relation with said nozzle and defining therewith generally an annular extrusion orifice of diminishing interior dimensions, through which said extrudate can flow uninterruptedly and form a parison within the nozzle and around the mandrel, the latter having a pressurized air supply passage communicating with at least one vent positioned within said parison for introducing said air to the interior of the latter, said interior communicating with the atmosphere, and a tubular mold cavity formed by a series of forwardly moving molds, characterized in that said air supply passage communicates with a tangential inlet of a vortex generation tube adapted to churn and heat up its peripheral air stream and to expand and cool its central air stream, said tube having two axially disposed opposite outlets adapted to exhaust respectively said central and peripheral streams and communicating accordingly with said vent and a hot air evacuating passage disposed within said mandrel, said tube being enclosed within an elongate housing attached to said mandrel, said housing being axially disposed within said parison and defining a chamber having said vent and connected to said supply and evacuating passages of the mandrel.

4,545,752

DEVICE FOR INJECTION MOLDING ARTICLES WHILE SIMULTANEOUSLY FORMING PATTERNS THEREON

Keiji Hanamoto, Saitama, and Fumio Takagi, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,757

Claims priority, application Japan, Aug. 17, 1982, 57-142398; May 4, 1983, 58-78592

Int. Cl.[4] B29C *6/00*

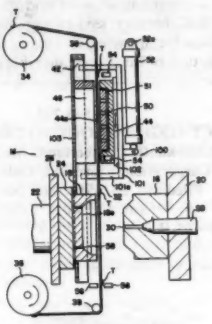
U.S. Cl. 425—112 **7 Claims**

1. A device for molding an article by injection molding while simultaneously imprinting on or transferring onto the molded article each pattern which is printed on a continuous sheet in a predetermined pitch, wherein the pattern sheet is pressed under the air pressure against the cavity surface of a female mold prior to the injection molding, and molten plastic material is injected from a male mold into the cavity defined by said male and female molds which are mated together, whereby said pattern sheet and the molded article are integrated with each other, said device comprising:

(a) a sheet supporting means comprising a pattern-sheet supply roll and a pattern-sheet take-up roll which are so arranged that said pattern sheet is transported so as to cover the opening of a female mold;

(b) a pattern-sheet-holding-and-transferring means for holding a predetermined part of the pattern sheet on which the pattern to be imprinted on or transferred onto the article is formed and transferring the part thereof to the opening of the female mold, said means comprising:

(i) a cover means having a plurality of air passages in opposed relationship with the pattern sheet and a heating means for softening the pattern sheet,



(ii) a frame means which coacts with said cover means so as to clamp said pattern sheet therebetween and which is movable in unison with said cover means,

(iii) a transfer means which reciprocates said pattern-sheet-holding-and-transferring means by one pitch between the adjacent patterns on said pattern sheet,

(iv) detection means mounted on said cover means or said frame means for detecting the register marks which are marked apart from each other by a predetermined distance on said pattern sheet, and

(v) a shift means responsive to the outputs from said detection means for shifting the cover means and frame means in unison with each other to the predetermined position with respect to the pattern on the pattern sheet; and

(c) an air operating means connected to the air passages of the cover means to suck the pattern sheet against the heating means of the cover means and to press the pattern sheet against the cavity surface of the female mold.

4,545,753

INJECTION MOLDING MACHINE WITH SELF-CONNECTING EJECTION DEVICE

Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,355

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243991

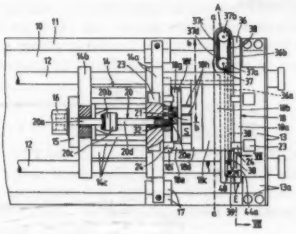
Int. Cl.[4] B29C *1/00*

U.S. Cl. 425—350 **7 Claims**

1. In a die closing unit of an injection molding machine which comprises a stationary die carrier plate and a movable die carrier plate adapted for the attachment thereto of the

stationary and movable die halves of one of a plurality of interchangeable die assemblies, and which further comprises a die changing mechanism for the mechanical insertion of said die assembly into, and removal from, the die closing unit in transfer movements along a transfer path which is oriented transversely to the center axis of the die closing unit along which the movable die carrier plate and an associated movable die half execute die opening and closing movements, and wherein the die changing mechanism includes a transfer drive which produces said transfer movements, and the movable die carrier plate and its associated movable die half define a device for ejecting the injection-molded parts from the movable die half in the open position of the die closing unit, said parts ejecting device including an ejection actuator and an ejector rod which are associated with the movable die carrier plate, the ejector rod being guided for ejection movements parallel to the center axis of the die closing unit and having a drive extremity pointing axially inwardly in the direction of the movable die half, and wherein the parts ejection device further includes an ejector member which forms part of the movable die half and is movable axially in relation thereto; in such a die closing unit, a mechanism for connecting the ejector member of said movable die half to the drive extremity of the ejector rod of the ejection actuator, said connecting mechanism comprising in combination:

stop-start means defined by the transfer drive means of the die changing mechanism for interrupting the transfer movements of a die assembly in a stop position which is located a short distance from an inserted position in which



the die halves of the die assembly are transversely aligned with, and attachable to, their respective die carrier plates;

a transverse mounting face on the axially inner side of the movable die carrier plate and a cooperating transverse mounting face on the axially outer side of the associated movable die half, said mounting faces being arranged to remain substantially contiguous during the transfer movements of the die assembly;

an axial opening in the movable die carrier plate through which the ejector rod is movable from a retracted position in which its drive extremity is located axially outside said contiguous mounting faces to a connection position in which the drive extremity is located axially inside said contiguous mounting faces;

an axial recess in the mounting face of the associated movable die half so shaped that it accommodates the drive extremity of the ejector rod in its connection position, while permitting the die assembly to execute transfer movements between its stop position and its inserted position;

a first connecting member defined by the drive extremity of the ejector rod;

a second connecting member attached to the ejector member of the associated movable die half, said second connecting member being arranged within the axial recess of the movable die half and aligned axially with the first connecting member of the ejector rod, when the die assembly is in its inserted position; and wherein

the first and second connecting members are shaped to engage each other to produce an axial drive connection between the ejector rod and the ejector member of the movable die half, when the ejector rod is in its connection position and the die assembly moves from its stop position to its inserted position; and

the first and second connecting members disengage from each other, when the die assembly moves from its inserted position to its stop position.

4,545,754

APPARATUS FOR PRODUCING MOLDINGS FROM CONCRETE

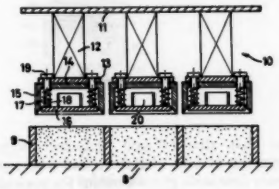
Joachim Scheidt, Hiddenhausen, and Gottfried Keller, Allmendingen, both of Fed. Rep. of Germany, assignors to Rampf Foreman GmbH, Allmendingen, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 588,641

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 8307078[U]

Int. Cl.⁴ B30B *11/02*

U.S. Cl. 425—419 **8 Claims**



1. An apparatus for producing moldings from concrete et cetera, particularly concrete paving stones and lawn stepping stones, the top side of which exhibits partial surfaces of different vertical level, with a molding table, with a molding frame and with a stamp fitted in the latter, guided movably at right angles to the molding table and provided with a superimposed load, wherein the stamp consists of two separate partial stamps (**15,16**) guided in each other, the end cross-sectional areas of which are dimensioned so that the one molds the lower-lying (**5**) and the other the higher-lying top partial surfaces (**4**) of the molding, and that the stroke distance of the partial stamp (**16**) for the higher-lying partial surfaces (**4**) is limited relative to the other partial stamp (**15**) in a upper consolidation position, in which both partial stamps (**15,16**) conjointly reproduce the top side of the molding, and in a lower mold-removal position, by stops (**19,20**).

4,545,755

APPARATUS FOR MAKING A PRESSED BODY

Benjamin Furch, and Friedrich-Wilhelm Rost, both of Unterluess, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,598

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207191

Int. Cl.⁴ B28B *17/00*

U.S. Cl. 425—420 **11 Claims**

1. An apparatus for compressing a body of fluent particles of an explosive material, the apparatus comprising:

a die formed with an upwardly open and laterally closed pressing cavity adapted to hold a mass of the fluent particles to be pressed;

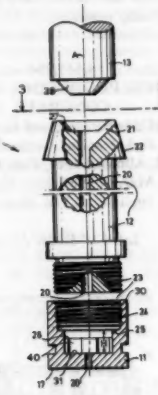
a punch having a lower portion substantially complementary to and fittable in the pressing cavity and having a lower face engageable with the mass in the cavity, the punch being formed with a throughgoing vent passage having a lower end opening at the lower face and an upper end opening thereabove to the surroundings;

said lower portion also including a chamber of predetermined axial extent;

means for displacing the punch relative to the die between

an upper position clear thereof and a lower position engaged in the cavity and compressing the mass therein and through an intermediate position between the upper and lower positions; and

a plate-like valve member having an axial extent which is



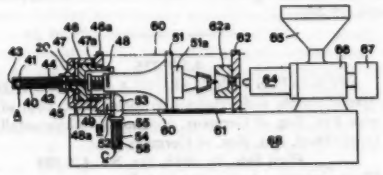
less than that of said chamber reciprocally movably mounted in said chamber, said valve member having a lower face with groove means for permitting free gas flow therethrough when the punch is in and between the intermediate and upper positions and for blocking flow therethrough between the intermediate and lower positions.

4,545,756

HYDRAULIC CLAMPING APPARATUS FOR AN INJECTION MOLDING MACHINE

Sakurai Hiroshi, 27-4, Minamioi 5-chome, Shinagawa-ku, Tokyo, Japan (140), and Kim Yong Chul, Room 701, No. 2 Bldg., Han-nam Heights Apt., Oksoo-dong, Sung-dong-ku, Seoul, Rep. of Korea

Filed Jul. 20, 1984, Ser. No. 632,969
Int. Cl.[4] B29F *1/00*
U.S. Cl. 425—590 **22 Claims**



1. Hydraulic clamping apparatus for an injection molding machine comprising:

base means;

a first support means for supporting a first mold and retained by said base means;

a second support means for supporting a second mold and retained by said base means, said second support means being movable relative to said base means along a path so as to move said second mold into engagement with said first mold;

a first hydraulic actuator comprising a first cylinder, a first piston retained thereby, and a rod coupled between said first piston and said second support means; said first actuator operable to produce reciprocating first strokes of said rod along said path;

a second hydraulic actuator comprising a second cylinder and a ram piston shaped and arranged so as to permit with respect thereto relative movement along said path of said second support means; said ram piston having a diameter substantially greater than said first piston and movable along said path in reciprocating second strokes substantially shorter than said first strokes; said second cylinder comprising large and small diameter portions retaining respectively a large diameter portion of said ram piston and a small diameter portion thereof, said ram piston defining an opening that is axially aligned with and receives said rod which is connected to an engagement portion of said second support means, and said second actuator further comprising a first annular seal between said large diameter portions of said second cylinder and said ram piston and a second annular seal between said small diameter portions thereof; and

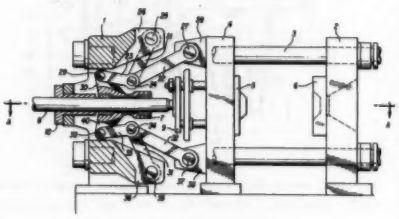
a clutch means operable to engage said second piston with said engagement portion of said second support means so as to produce movement thereof in response to said second strokes.

4,545,757

INJECTION MOLDING MACHINES

Romeu Romi, Sta. Barbara d'Oeste, Brazil, assignor to Industrias Romi S/A, Santa Barbara, Brazil

Filed Mar. 9, 1984, Ser. No. 587,938
Claims priority, application Brazil, Mar. 9, 1983, 8301222
Int. Cl.[4] B29F *1/00*
U.S. Cl. 425—593 **9 Claims**



1. An injection molding machine, comprising:

articulating means including a movable cross arm;

first actuator means for moving said movable cross arm;

a central rod having an end and guiding said movable cross arm;

a support plate attached to said end of said central rod;

extraction means including exclusive guideways and a part extracting plate resting and slidable on said exclusive guideways; and

second actuator means supported by said support plate which also supports said extraction means.

4,545,758

POT-TYPE OIL BURNER

Kazuharu Nakamura; Motoki Matsumoto; Tooru Yoshino, and Yoshimasa Tsuboi, all of Aichi, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed May 5, 1983, Ser. No. 491,623
Claims priority, application Japan, May 28, 1982, 57-91830
Int. Cl.[4] F23D *11/02, 11/44*
U.S. Cl. 431—208 **18 Claims**

1. A pot-type oil burner comprising:

a pot for carrying out the vaporization, mixing, ignition and combustion of fuel oil supplied thereto;

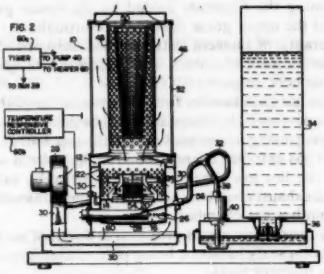
a heat-resistant fabric spread on the bottom surface of said pot;

a heating means, arranged in said pot and positioned above said fabric, for heating said pot and said fabric to vaporize fuel oil supplied to said pot, said heating means being

positioned sufficiently close to said fabric to cause ignition and burning of fuel oil vaporized by said fabric;

a nozzle means extending into said pot for introducing fuel oil from an oil supply means therethrough into said pot and onto said fabric;

sensor means for providing a time delay between turning on said heating means and starting the supply of said fuel oil from said nozzle means to said pot, said time delay being



sufficient for said heating means to heat said pot and said fabric to a temperature sufficient to vaporize said fuel oil; and,

means responsive to said sensor means for starting the supply of fuel oil from said nozzle means to said pot after said heating means is turned on and said pot and fabric have been heated to a temperature sufficient to vaporize said fuel oil.

4,545,759

BURNER ATTACHMENT FOR AEROSOL CONTAINER

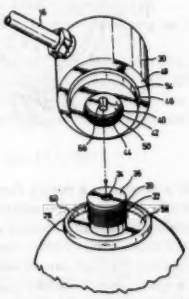
George B. Giles, Scarborough; Donald B. Ross, Markham; Joseph J. McCallion, Toronto, and William C. Sherritt, Brampton, all of Canada, assignors to Giles Tool Agencies Limited, Scarborough, Canada

Filed May 2, 1984, Ser. No. 606,126

Claims priority, application Canada, Feb. 10, 1984, 447213

Int. Cl.[4] F23D *13/04*

U.S. Cl. 431—344 **11 Claims**



1. An attachment for a fuel container of the aerosol type, the container having a raised stem portion spaced within an annular rim with an upper surface, stem portion having a threaded outer surface and a central bore extending from an upper surface to receive an actuator pin to operate a self-sealing outlet valve in the container, the attachment comprising a body with a fuel flow passage extending between an integral fuel inlet opening and a fuel outlet opening, an actuator pin mounted in the body to actuate the self-sealing outlet valve in the container, the body having a cylindrical inlet boss extending around a central downwardly opening well with an upper surface from which the inlet opening extends and an outer wall which terminates at an outwardly extending shoulder, first resilient seal means located in the well around the inlet opening, and second resilient seal means extending around the inlet boss, the inlet boss having a threaded inner surface which engages the threaded external surface of the stem portion of the container in an assembled position wherein the inlet boss is seated between the raised stem portion and the annular rim portion of the container, whereby as the attachment is screwed onto the container in the assembled position a double seal against leakage and structural support is provided by the simultaneous engagement of the first seal means between the upper surface of the well and the upper surface of the stem portion of the container and the second seal means between the upper surface of the annular rim of the container and the outwardly extending shoulder.

4,545,760

ORTHODONTIC DEVICE

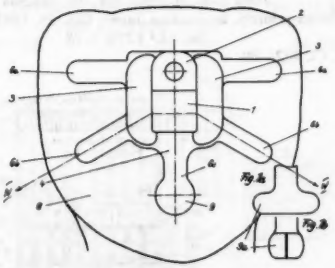
Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Bernhard Forster GmbH, Pforzheim, Fed. Rep. of Germany

Filed Feb. 16, 1984, Ser. No. 580,819

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308104

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—18 **9 Claims**



1. In an orthodontic device comprising a backing pad and a bracket having a base portion secured to said backing pad on one side thereof,

the improvement comprising

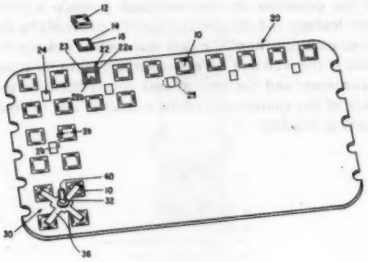
said backing pad having laterally outwardly protruding, bendable side arms, said side arms comprising at least one activating arm having an enlarged end portion for an activating connection, and

said backing pad being provided on the side thereof opposite to that secured to the base portion with a metal fabric adapted to be adhesively fixed to a tooth, said activating arm, when being installed in the mouth of a patient, being arched and extending downwardly towards the gum of said patient, and said enlarged end portion being engageable with an adjacent side arm of an adjacent similar orthodontic device when said orthodontic devices are used to improve the occlusion of adjacent teeth.

4,545,761
METHOD AND APPARATUS FOR SECURING ARTICLES IN PLACE ON A SUBSTRATE

John S. Cartwright, Hopewell Township, Mercer County, N.J., and Jerry C. Hurst, Muhlenberg Township, Berks County, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 10, 1984, Ser. No. 680,003
Int. Cl.[4] F27D *5/00*
U.S. Cl. 432—5 20 Claims



15. A method of securing a plurality of articles in place on a substrate, said method comprising:

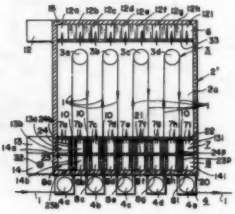
(a) lockably inserting a first end of an elongated member in the substrate; and

(b) simultaneously capturing the articles between the substrate and a plurality of arms extending radially out from the elongated member.

4,545,762
APPARATUS FOR PRODUCING OXIDIZED FILAMENTS

Yosihumi Arita; Yukihiro Murakami, and Miyabi Yuasa, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,504
Claims priority, application Japan, Oct. 28, 1982, 57-189765
Int. Cl.[4] F27B *9/28*
U.S. Cl. 432—59 10 Claims



1. An apparatus for continuously producing continuous oxidized filaments comprising

a furnace containing a heated oxidized atmosphere therein, said furnace being provided with an upper wall and a bottom wall,

means for continuously introducing precursor filaments into the furnace where they are converted into oxidized filaments and means for removing the oxidized filaments from the furnace,

a plurality of upper guide rollers provided in the upper portion of the furnace and a plurality of lower guide rollers provided outside the furnace adjacent the bottom wall thereof, said filaments being conveyed on said guide rollers,

a plurality of hot gas entrance chambers provided at the lower portion of the furnace, said entrance chambers communicating with the furnace,

at least one hot gas exhaust chamber provided in the upper portion of the furnace between the plurality of upper guide rollers and the top wall of the furnace, said exhaust chamber communicating with the furnace,

a plurality of gas suction seal chambers disposed in the furnace between the plurality of hot gas entrance chambers and the bottom wall of the furnace,

a plurality of apertures provided in the bottom wall for passing the filaments guided by the lower guide rollers and the upper guide rollers therethrough,

a plurality of filament paths formed between adjacent gas suction seal chambers and adjacent hot gas entrance chambers, respectively,

a main hot gas chamber formed between the plurality of hot gas entrance chambers and the hot gas exhaust chamber,

hot gas passing means provided in the top wall of each of the hot gas entrance chambers and in the bottom wall of each of the hot gas exhaust chambers whereby said entrance and exhaust chambers are in fluid communication with the main hot gas chamber,

a seal gas passing means provided at a wall of each of the gas suction seal chambers, being in fluid communication with the filament paths;

a hot gas supply means in fluid communication with each of the hot gas entrance chambers,

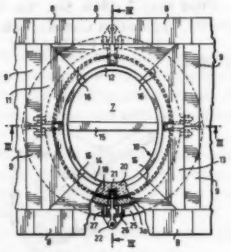
a hot gas exhaust means in fluid communication with the hot gas exhaust chamber, and

a seal gas suction means in fluid communication with each of the gas suction seal chambers.

4,545,763
INLET FOR A COOLER IN A ROTARY FURNACE

Allan Othman, Pargas, Finland, assignor to Oy Partek Ab, Pargas, Finland

Filed Sep. 2, 1983, Ser. No. 528,855
Claims priority, application Finland, Nov. 26, 1982, 824088
Int. Cl.[4] F27D *15/02*
U.S. Cl. 432—78 8 Claims



1. An inlet for a cooler in a rotary furnace that includes an inclined furnace tube having a steel mantle, an inner protective lining, and a plurality of satellite coolers mounted at the lower end of the furnace tube, each cooler communicating with the interior of said furnace through one of said inlets and each said inlet including a steel jacket fixedly connected to the steel mantle of the furnace tube, said inlet comprising:

an inlet lining in each cooler;

a frame structure masoned of prefabricated lining blocks (8,9);

a prefabricated central part (10) mounted within said frame structure (8,9) and including a mould (18,19) and a lining (11–14 and 20) cast in the mould, the mould (18,19) of the central part (10) being assembled of two parts, the first part (18) being provided at least substantially at the level of the lining of the furnace tube and the second part (19) being provided along the inside of the steel jacket (3A) of

the cooler inlet, the connection between the two mould parts (**18,19**) substantially following the direction of the mantle of the furnace tube, and the lining (**11–14** and **20**) cast in the first mould part (**18**) being separately removable and the lining of the first mould part (**18**) being formed by a plurality of lining blocks (**11–14**) separated by tension-relieving seams (**16**), said blocks being separately removable; and

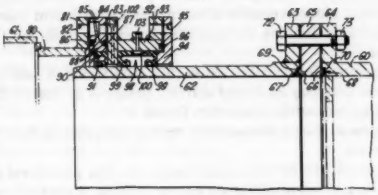
means (**21–25**) removably connecting said central part (**10**) to the steel jacket (**3A**) of the cooler inlet.

4,545,764

ROTARY KILN ASSEMBLIES, METHOD OF CHANGING SEAL ARRANGEMENTS AND SEAL ARRANGEMENTS FOR USE IN A ROTARY KILN ASSEMBLY

George M. Gillies, St. Annes; Leslie P. Kennett, Croft, and Clive A. Mathews, Fulwood, all of England, assignors to British Nuclear Fuels Limited, Risley, England

Filed May 24, 1983, Ser. No. 497,722
Int. Cl.[4] F27B *7/38*
U.S. Cl. 432—115 **6 Claims**



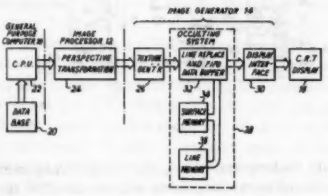
1. A rotary kiln assembly in which a first seal arrangement is disposed between an inlet arrangement and a rotary kiln, a second seal arrangement is disposed between the rotary kiln and an outlet arrangement, and at least one of the seal arrangements is axially telescope and retractable, the kiln assembly also including detachable axial spacing means for removal for enabling said one of the seal arrangements to be removed from the kiln assembly as a unit for maintenance without fouling or movement of the kiln or the inlet or outlet arrangements, the spacing means being detachable from the kiln assembly only after retraction of the said one of the sealing arrangements.

4,545,765

SCENE SIMULATOR

Kevin M. Jarvis, Sussex, England, assignor to The Singer Company, Binghamton, N.Y.

Continuation of Ser. No. 417,795, Sep. 13, 1982, abandoned, and a continuation of Ser. No. 102,706, Dec. 12, 1979, abandoned. This application Oct. 31, 1983, Ser. No. 547,531
Claims priority, application United Kingdom, Oct. 25, 1979, 7937108
Int. Cl.[4] G09B *9/02*
U.S. Cl. 434—43 **5 Claims**



1. In a training apparatus in which an operator can gain experience in the performance of a predetermined task without the cost and without the risk that is inherent in the performance of the task in the real world, the training apparatus including a computer generated video visual display of a predetermined scene composed of features, lines and surfaces, and some of the surfaces may occult other features in the scene, the image generator comprising:

general purpose computer means including a central processing unit and a data base for containing information on every feature to be displayed;

general processor means including a perspective transformation means to convert isometric coordinates to perspective coordinates connected at the output of said computer means;

image generator means connected to receive an output signal from said perspective transformation means and including a texture generator, an occulting system, and a display interface means;

said occulting system including data buffer means, a line memory circuit, and a separate surface memory circuit;

said line memory circuit having sufficient locations to store data at locations relating to the maximum number of lines occurring in all occulting surfaces;

said surface memory circuit having one memory location for each surface, each memory location storing horizontal start and end points of said surface, maximum value to observer, and maximum value of top points of said surface; and

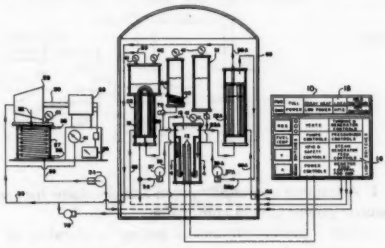
means for comparing data of each incoming feature successively with data stored in surface memory locations to determine whether the possibility of occulting is indicated, so that said data of an incoming feature is connected into said data buffer means, when no occulting is indicated, for connection to said display interface means.

4,545,766

TRAINING DEVICE FOR NUCLEAR POWER PLANT OPERATORS

Glen J. Schoessow, Gainesville, Fla., assignor to PowerSafety International, Inc., Lynchburg, Va.

Continuation-in-part of Ser. No. 331,141, Dec. 16, 1981, abandoned. This application Sep. 21, 1983, Ser. No. 534,322
Int. Cl.[4] G09B *9/00*
U.S. Cl. 434—218 **24 Claims**



1. In a training device for nuclear power plant operators including

(a) a reactor containing a liquid, heating element immersible in the liquid and capable of heating the liquid to elevated temperatures, and piping and pumping means to transport the liquid in a closed circuit from the reactor to a steam generator and return to the reactor;

(b) a steam generator comprising a vessel containing water, heat exchange tubes submerged in the water with high temperature liquid from the reactor passing through the heat exchanger tubes and heating the water to its vaporization temperature, and piping and pumping means to transport steam from the generator to a turbine;

(c) a steam turbine receiving high energy steam and dis-

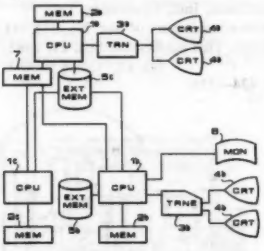
charging lower energy steam, and piping and pumping means to transport the lower energy steam to a condenser;
(d) an electric generator operatively connected to the turbine so as to generate electricity as the turbine rotates;
(e) a condenser to receive low energy steam from the turbine, condense the steam to water, and piping and pumping means to return the water to the steam generator; and
(f) means to monitor the temperature and pressure of the liquid in the reactor and the proportion of the heating elements submerged in water;
the improvement comprising
(1) visible indicating means to identify the physical status of the power plant in any of a variety of selected modes of normal and abnormal operation; and
(2) piping, valving, and pumping means to provide manual controls and electrical controls assembled in a central location to produce any of a variety of selected modes of operation, both normal and abnormal, of the power plant, and to accomplish an acceptable corrective response to an abnormal operation of the power plant.

4,545,767

TRAINING OPERATION SYSTEM AND SIMULATOR FOR TRAINING IN ELECTRIC POWER SYSTEM

Mamoru Suzuki, Tokyo, and Hiromoto Tanaka, Hyogo, both of Japan, assignors to The Tokyo Electric Power Company Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,352
Claims priority, application Japan, Dec. 17, 1982, 57-201516
Int. Cl.⁴ G09B *9/00*
U.S. Cl. 434—224 **3 Claims**



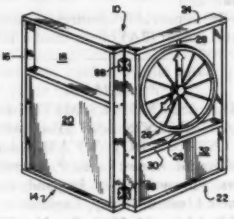
1. A training operation system and simulator for training in electric power system comprising:
trainer input-output means having a plurality of buttons respectively corresponding to a plurality of training items regarding training simulation for manually selecting one of said items to be subsequently operated;
trainee input-output means for entering proper data in response to the simulated conditions provided through the execution of the selected training item; and
processing means connected both to the trainer input-output means and to the trainee input-output means for storing, upon request, in a predetermined storage means a current time and the information of current status regarding the training in response to a first command from the trainer input-output means and for reviewing the training from a time designated by the current time and the information which corresponds to a part or whole of the requested training pattern read out in response to reception of a second command commanding to review the training.

4,545,768

ACTIVITY CENTER

John Hinnen, 307 W. Melbourne Ave., Peoria, Ill. 61604

Filed Dec. 5, 1983, Ser. No. 558,364
Int. Cl.⁴ G09B *19/12*
U.S. Cl. 434—304 **5 Claims**



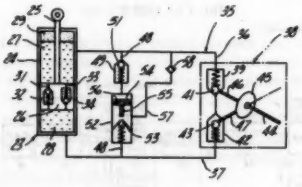
1. An activity center comprising:
a plurality of polygonal frames pivotably connected together along mutually adjacent sides of adjacent frames;
each frame defining an open area accessible from each side thereof;
an activity device mounted within each frame in said open area whereby each said activity device is accessible from either side of its respective frame;
wherein at least a first activity device comprises a clock-like device;
said clock-like device comprising a circular peripheral portion, a substantially open center portion, a centrally supported center member, and a pair of arms rotatably supported on said center member;
said circular peripheral portion comprising a plurality of apertures spaced about at least one face thereof, said activity center further comprising a plurality of indicia-bearing elements selectively mountable in any of said apertures; and
means for pivotally mounting said clock-like device within its respective frame whereby each face of said clock-like device is selectively accessible from each side of its respective frame.

4,545,769

TILT LOCKING SYSTEM FOR BOAT PROPELLERS

Ryoji Nakahama, Iwata, and Kenichi Handa, Hamamatsu, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed May 9, 1983, Ser. No. 492,745
Claims priority, application Japan, Jun. 8, 1982, 57-96977
Int. Cl.⁴ B63H *5/12*
U.S. Cl. 440—61 **16 Claims**



1. In a tilt locking and shock absorbing arrangement for a marine outboard trim comprising a drive member supported for tilting movement relative to a hull of an associated watercraft about a substantially horizontally disposed tilt axis, a hydraulic assembly comprising a cylinder and a piston slidably supported in said cylinder and defining first and second cham-

bers, means for operatively interposing said hydraulic assembly between said hull and said drive member for relative movement of said piston and said cylinder upon tilting movement of said drive member about said tilt axis, a first passage including pressure responsive absorber valve means for permitting flow from said first chamber to said second chamber upon the application of a predetermined force tending to cause said drive member to tilt up about said tilt axis, and a second passage including pressure responsive relief valve means for permitting flow from said second chamber to said first chamber upon the exertion of a predetermined force to effect tilt down of said drive member, the improvement comprising means for controlling the movement of said drive member about said tilt axis comprising a third passage extending between said first and second chambers, first check valve means in said third passage including a check valve element normally biased to a closed position and opened in response to fluid pressure on said valve element for permitting flow from said first chamber to said second chamber and for precluding flow from said second chamber to said first chamber through said third passage, second check valve means in said third passage including a check valve element normally biased to a closed position and opened in response to fluid pressure on said valve element for permitting flow from said second chamber to said first chamber and for precluding flow from said first chamber to said second chamber through said third passage, and control means for selectively opening one of said check valve means so that the other of said check valve means will control the direction of flow through said third passage.

4,545,770

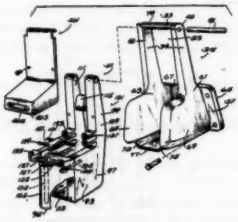
OUTBOARD MOTOR MOUNTING ARRANGEMENT

Arthur R. Ferguson, Northbrook, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 293,324, Aug. 17, 1981, Pat. No. 4,449,945. This application Apr. 30, 1984, Ser. No. 605,141

Int. Cl.⁴ B63H *21/26*

U.S. Cl. 440—61 **3 Claims**



1. An outboard motor comprising a transom bracket adapted for mounting to a boat transom, a swivel bracket, means connecting said swivel bracket and said transom bracket for pivotal movement of said swivel bracket relative to said transom bracket about a tilt axis which is horizontal when said transom bracket is boat mounted, a propulison unit including an internal combustion engine and a propeller mounted for rotation and driven by said engine, means connecting said propulsion unit to said swivel bracket for common movement of said propulsion unit with said swivel bracket about said tilt axis and for pivotal steering movement of said propulsion unit relative to said swivel bracket about a steering axis transverse to said tilt axis, and means for rotatably displacing said propulsion unit relative to said swivel bracket including an extensible and contractable link located below said tilt axis and pivotally connected to said propulsion unit and to said swivel bracket about axes parallel to said steering axis.

4,545,771

PROPELLER

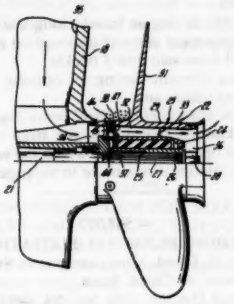
Takeshi Iio, Hmamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Jul. 14, 1983, Ser. No. 513,848

Claims priority, application Japan, Aug. 23, 1982, 57-144798

Int. Cl.⁴ B63H *1/20*

U.S. Cl. 440—89 **15 Claims**



1. In an exhaust system for a marine propulsion unit comprising a propeller fixed against substantial axial movement to a shaft driven by an engine and adapted to be submerged in the water for propelling a watercraft and an exhaust system for the engine including exhaust outlet means for delivering exhaust gases in proximity to said propeller for aerating the water around said propeller, the improvement comprising speed responsive valve means for controlling the discharge of exhaust gases from said exhaust outlet means for discharge of exhaust gases therefrom only at certain speeds of said propeller.

4,545,772

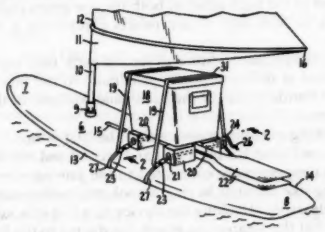
SAILBOARD CARGO CARRIER

Philip J. Stockhausen, 370 Upper Terrace, Apt. 6, San Francisco, Calif. 94117

Filed May 14, 1984, Ser. No. 610,275

Int. Cl.⁴ B63B *43/04*

U.S. Cl. 441—74 **3 Claims**



1. A detachable cargo carrier adapted for a sailboard comprising:

at least two sets of substantially incompressible support pads disposed in spaced apart relation across the width of the upper surface of the hull of the sailboard, each set of pads being disposed an equal distance inward from each adjacent edge of said hull,

lateral openings in each said support pad to accommodate straps across the width of said hull,

straps passing through said lateral openings in said pairs of said support pads and around said hull to fixedly secure said pads to said hull, said straps extending over cargo resting on said pads to secure said cargo in place, and

a board buckle having an interlocking sliding element and tension adjustment element disposed on one side of the hull,

said sliding element being fixedly secured to said strap on the side proximate to the adjacent pad, and

said tension adjustment element havng two adjacent openings through which said strap is looped to provide frictional resistance to slippage of the strap along the hull, and

a cargo buckle having an interlocking sliding element and tension adjustment element disposed on the opposite side of the hull from said board buckle,

said sliding element having an opening through which said strap slides, and

said tension adjustment element being disposed proximate to the knotted free end of the strap and having two adjacent openings through which the strap is looped to provide frictional resistance to slippage of said strap.

4,545,773

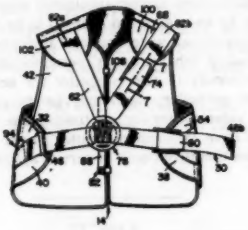
SAILBOARDING PERSONAL FLOTATION DEVICE

Karla R. Evert, St. Cloud, Minn., assignor to Stearns Manufacturing Company, St. Cloud, Minn.

Filed Dec. 14, 1982, Ser. No. 449,631

Int. Cl.[4] B63C 9/08

U.S. Cl. 441—114 **5 Claims**



1. A sailboarding personal flotation device designed to be worn on the torso of a wearer comprising:

(a) a back panel, a right-front panel, and a left-front panel, each panel having a top zone and a bottom zone, the right-front and left-front panels being cooperatively connected to the back panel at both the top zones and bottom zones, at least one of the panels comprising a buoyant mass;

(b) a first strap having first and second ends, both ends being attached at different points proximate to the intersection of the bottom zones of the back panel and one of the front panels;

(c) a joining member connected to the first strap;

(d) a second strap having a first and second end, the first end being cooperatively connected to the joining member;

(e) a ring-like member having a hook protruding outwardly for releasably attaching the device to a line of a sailboard, such that the wearer can attach the device to the line, lean back, and be held up by the line, the ring-like member including an annular portion and a center portion, the center portion being interconnected to the annular portion by means of spokes, the spokes thereby dividing the ring-like member into a top quadrant, a bottom quadrant, a first lateral quadrant and a second lateral quadrant;

(f) means for self-adjustment of the position of the ring-like member to provide for the ring-like member to be located at the proper balance point for the wearer when the device is releasably attached to a line of the sailboard and the wearer leans back, comprising a tape having a first and second end, both ends being attached to the device near the front edge of a front panel, the tape being positioned substantially parallel to the front edge, the second strap being slidably connected to the ring-like member by means of the second end of the second strap being threaded sequentially through the first lateral quadrant such that the second strap passes between the center portion of the ring-like member and one of the front panels, the second strap next passing between the tape and the front panel, the second strap next passing through the second lateral quadrant, the tape having sufficient length to provide a limited distance between the first and second ends of the tape in which the second strap can move horizontally and, to a relatively lesser extent vertically, between the tape and the front panel;

(g) a third strap having first and second ends, both ends being attached at different points proximate to the intersection of the bottom zones of the back panel and the other front panel;

(h) a releasable clip cooperatively connected to the third strap, for engagement with the second strap;

(i) a fourth strap having a first and second end, the first end being attached proximate to the intersection of the top zone of the back panel and one of the front panels, the fourth strap being cooperatively connected to the ring-like member;

(j) a fifth strap having a first and second end, the first end being attached proximate to the intersection of the top zone of the back panel and the other front panel; and

(k) a releasable clip cooperatively connected to the second end of the fifth strap, for engagement with the fourth strap.

4,545,774

METHOD OF MANUFACTURING A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP MANUFACTURED BY THIS METHOD

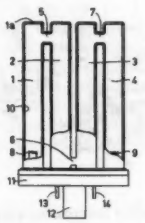
Wilhelmus M. J. Van Gils; Adrianus J. T. Mollet, and Johannes A. M. Ridders, all of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 28, 1983, Ser. No. 555,843

Claims priority, application Netherlands, Dec. 2, 1982, 8204673

Int. Cl.[4] H01J 9/26

U.S. Cl. 445—22 **2 Claims**



1. A method of manufacturing a low-pressure mercury vapour discharge lamp having a discharge vessel sealed in a vacuum-tight manner and comprising four substantially parallel and co-extending glass tube parts, adjacent tube parts being interconnected by a cross-coupling extending transversely to the longitudinal axis so that during operation of the lamp, at least the major part of each of the tube parts and the cross-couplings are traversed by the discharge, in which method the cross-coupling between two tube parts is established after the tube parts to be coupled have been provided with a luminescent layer, and sealed at one end characterized in that first a cross-coupling is formed between a first tube part sealed at one end and having a length l_1, whose other end is provided with a stem with an exhaust tube, and a tube part likewise sealed at one end and having a length l_1+l_2, whose other end is likewise provided with a stem with an exhaust tube, which tube parts

are arranged adjacent and parallel to each other and are then connected to each other through the cross-coupling which is at or near the sealed end of the first tube part, after which the tube part having a length l_1+l_2 is subdivided so that a second tube part having a length l_1 is obtained which is sealed at one end and carriers at its other end the stem with the exhaust tube, which tube part is removed, a tube part having a length l_2 sealed at both ends then being obtained which is already connected to the first tube part having a length l_1 through a cross-coupling, after which a second pair of tube parts of the same configuration is arranged mirror-symmetrically adjacent the first pair, a cross-coupling being established between the parallel extending tube parts having a length l_2.

4,545,775

DANCING HULA DOLL

Douglas S. T. Kim, 1350 Ala Moana Blvd., #403, Honolulu, Hi. 96814

Filed Sep. 17, 1984, Ser. No. 651,514

Claims priority, application Rep. of Korea, Mar. 30, 1984, 2801/1984

Int. Cl.[4] A63H *3/28, 11/00*

U.S. Cl. 446—299 **6 Claims**

1. A dancing hula doll comprising:

an upper portion, a lower portion, and a base portion;

the upper portion resembling the head through waist of a human;

the lower portion resembling the waist through hip portion of a human;

a pin pivotably connecting the upper portion to the lower portion;

a support rod supporting the upper portion and the lower portion above the base portion, one end of said support rod secured to the base portion and the other end of said support rod located in a cavity defined by the upper portion;

means to reciprocate the lower portion transverse to said support rod including a motor, a drive gear, a cam, a lever arm, and an activator pin, said drive gear being connected to the shaft of the motor, said cam being operatively connected to the drive gear, one end portion of the lever arm being operatively connected to the cam, the middle portion of the lever arm being connected to a pivot secured to the base portion, a slot defined by the other end portion of the lever arm engaging said activator pin, and the activator pin being connected to the inner surface of the lower portion;

said base portion including a turning plate, a stationary base with feet, gears for turning the turning plate when the motor is running, a switch, circuit means for playing an electronic melody, a speaker, and a battery;

the turning plate is spaced a predetermined distance from the stationary base;

a shaft, one end of the shaft being secured to the central portion of the stationary base and the other end of the shaft being secured to the base portion;

a central opening defined by the turning plate, said shaft passing through said central opening;

said gears being operatively connected to the shaft and to the drive gear;

said switch being connected to said battery;

said circuit means being connected to said battery;

said motor being connected to said battery; and

said battery being secured to the turning plate.

4,545,776

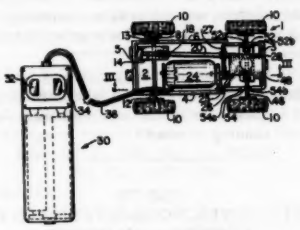
STEERING MECHANISM FOR SELF-POWERED VEHICLES AND VEHICLES EMPLOYING SAID STEERING MECHANISM

Nin Y. Law, Kowloon, Hong Kong, assignor to Soma Traders Ltd., Kowloon, Hong Kong

Filed Jun. 24, 1983, Ser. No. 507,343

Int. Cl.[4] A63H *29/00*

U.S. Cl. 446—443 **17 Claims**



1. A steering mechanism for vehicles of the type having a frame, a rear axle attached to the frame and having at least one wheel attached thereto, a front axle having wheels at either end, a reversible motor mounted on the frame, a power supply connected to the motor and a drive train for delivering power from the motor to at least one axle comprising:

(a) a crown gear mounted on the front axle between the wheels,

(b) a yoke fitted over and attached at opposite ends thereof directly to the front axle;

(c) a spur gear attached to the yoke in a manner so that it continuously engages and is substantially perpendicular to the crown gear and is connected to and driven by the drive train;

(d) a mounting which pivotally attaches the yoke at a location intermediate the ends thereof to the frame thereby enabling the axle to pivot relative to the frame; and

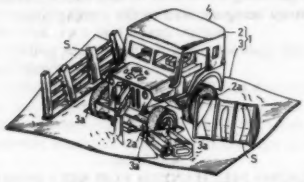
(e) spaced apart first and second stops mounted on each side of the frame so that the spacing in each pair of stops is wider than the front axle and positioned so that when the motor is turning in a forward direction the front axle rotates in a forward direction, abuts the first stops on each side of the frame and is substantially parallel to the rear axle causing the vehicle to move forward in a substantially straight line, and when the rotation of the motor is reversed a torque acting on the spur gear and attached yoke will cause the yoke and attached front axle to pivot to a position where the front axle rests against the second stops on each side of the frame and is not parallel to the rear axle and will cause the front axle to rotate in a backward direction causing the vehicle to move in a backward direction and turn.

4,545,777

DIORAMATIC RUNNING TOY

Hirohisa Satoh, Nagareyama, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,746
Claims priority, application Japan, Dec. 24, 1982, 57-197008[U]
Int. Cl.[4] A63H 17/26
U.S. Cl. 446—457 3 Claims



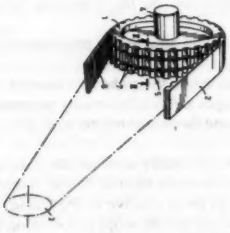
1. A dioramatic running toy comprising;
a running member including a housing and a wheel assembly rotatably mounted to said housing;
a dioramatic panel having a top surface and a bottom surface and provided with through holes perforated from said top surface to said bottom surface for receiving said wheel assembly therein, said top surface comprising means portraying a scene which provides a setting for said running member; and
connecting means for removably attaching said housing to said dioramatic panel with said wheel assembly received in said holes so as to enable said dioramatic panel to run with said running member.

4;545,778

COG-BELT-DRIVEN, NOISE-SUPPRESSED POWER TRANSMISSION DEVICE

Jorma Koivula, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Feb. 17, 1983, Ser. No. 467,250
Claims priority, application Finland, Mar. 10, 1982, 820818
Int. Cl.[4] F16H 7/02
U.S. Cl. 474—153 3 Claims



1. Cog-belt-driven, noise-suppressed power transmission device comprising a belt pulley provided with a cogging on the outer periphery and a belt provided with a corresponding cogging on the inner surface, engaging said cogging of the belt pulley, whereby said belt rotates around said belt pulley and a second drive means for transmitting power between said belt pulley and said drive means, wherein said cogging of the belt pulley and/or the belt is provided with one or more discharge channels for air entrapped between the coggings, said discharge channels connecting the cog gaps to the atmosphere,

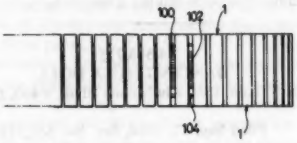
said cogging or said coggings are further provided with at least one groove parallel with the direction of rotation wherein said groove extends underneath the cog bottoms of said cogging.

4,545,779

POWER TRANSMISSION ENDLESS BELT

Shiro Sakakibara, Toyokawa, and Yoichi Hayakawa, Toyoake, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Anjo, Japan

Filed Jan. 25, 1983, Ser. No. 460,724
Int. Cl.[4] F16G 5/18
U.S. Cl. 474—240 7 Claims



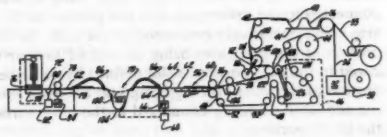
1. A power transmission endless belt for transmiting a torque from one to the other of a pair of pulleys each having contact surfaces formed of two coaxially and oppositely disposed conical surfaces, comprising:
a plurality of metal blocks each being formed of a trapezoidal plate having right and left sides, front and back surfaces, inclined contact surfaces formed at least in part of the entire area of the right and the left sides as viewed from the front thereof, at least one through hole or recess of a predetermined width cut through the thickness of said metal block and first and second grooves formed in each of the front and back surfaces of the metal block respectively, said grooves having a cylindrical surface; and
an endless connecting band formed of a plurality of links of similar length longitudinally and endlessly connected at the respective opposite ends thereof, said endless connecting band having a width capable of being loosely fitted in said through hole or in said recess in said metal block, said endless connecting band being inserted longitudinally through said through hole or said recess formed in said metal block along the direction of the thickness of said metal block, a first pin disposed in said first groove formed in the front surface of said metal block and pivotably joining the ends of longitudinally adjacent links and a second pin disposed in the second groove formed in the back surface of the metal block and pivotably joining the ends of longitudinally adjacent links, each said metal block being retained between a first and a second pin and thereby coupled to the endless connecting band.

4,545,780

APPARATUS AND METHOD OF MAKING CARTONS

William E. Martin, 6378 N. McKinley, Flushing, Mich. 48333

Continuation-in-part of Ser. No. 377,345, May 12, 1982, abandoned. This application Jan. 10, 1983, Ser. No. 456,550
Int. Cl.[4] B31B 1/10, 1/88
U.S. Cl. 493—11 18 Claims



1. The method of making pre-printed cartons comprising the steps of:,forming a continuous single-backed corrugated paper web, including forming uniformly spaced corrugations extending transversely of the direction of web travel and crushing single corrugations at uniformly spaced intervals along said web to form lines of weakening, printing a continuous web of

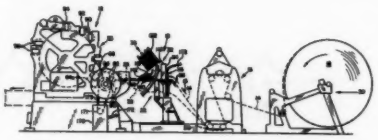
paper material with printed reference marks, joining said corrugated paper web and said continuous web of material to form a continuous double-back printed paper web, conveying said printed paper web from a first station to a second station, supporting said web in a slack condition between said first and second station while said web varies between a maximum and a minimum length, passing said web from said second station relative to a sensing means sensing the position of said reference marks, delivering said web to a press reciprocating at a uniform rate in timed relationship to the spacing of said reference marks, and varying the speed of said web delivered to said first station in accordance with the length of said web between said first and second stations, adding adhesive to all corrugations of said single-backed corrugated paper web except said single corrugations prior to joining said continuous web and said single-backed corrugated web.

4,545,781

METHOD FOR APPLYING COUPON PACKETS TO PAPER BAGS

Charles L. Carl, Portland; Ronald S. Gale, Beaverton, and William J. Forstrom, West Linn, all of Oreg., assignors to Willamette Industries, Inc., Beaverton, Oreg.

Filed Jan. 30, 1984, Ser. No. 575,501
Int. Cl.[4] B31B *1/90, 37/74*
U.S. Cl. 493—220 **9 Claims**



1. A method of applying a coupon packet to the outer face of the front panel of a four-sided self-opening paper grocery bag, comprising:

conveying a continuous web of bag paper in the longitudinal direction thereof;

bending the web in the longitudinal direction about an obtuse angle and continuously turning longitudinal margins of the web downwardly to form the web into a tube;

applying a strip of adhesive longitudinally to the upper side of the web between said margins at periodic intervals corresponding to the length of a segment defining a bag, the strip commencing at about the lengthwise midpoint of the segment;

after bending the web about the obtuse angle, feeding a coupon packet from a stack of packets flat onto the upper side of the web over the strip of adhesive to adhere the packet to the upper side of the web of bag paper;

periodically cutting a portion of the web transversely to define a top of a first bag and a bottom of a second bag;

folding portions of the longitudinal margins of each bag inwardly to form inwardly-folded side panels of the bag; and

folding the bottom of each bag to close same.

4,545,782

ANTI-DOG-EAR DEVICE FOR A FOLDING APPARATUS

Josef W. Niemiro, Berwyn, and Eugene Skipor, Elmwood Park, both of Ill., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1983, Ser. No. 459,565
Int. Cl.[4] B65H *45/16*
U.S. Cl. 493—425 **4 Claims**

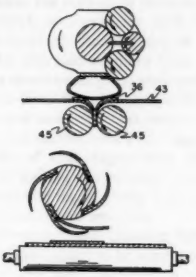
1. In an apparatus for quarter folding a half-folded newspaper having folded edges along two sides thereof and loose edges along the remaining two edges thereby, which apparatus includes:

a pair of cooperating fold rolls;

a surface located above the fold roll to receive half-folded newspapers, the surface having a slot through which a newspaper can be moved;

a rotating cage assembly located above the newspaper supporting surface;

a tucker blade carried on the rotating cage and movable to tuck a newspaper through the slot in the supporting surface during each revolution of the cage assembly, the combination comprising:



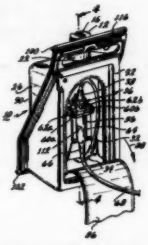
guide shoe means separate from said tucker blade and carried by the rotating cage assembly at a location thereon such that the space between the cage assembly and the supporting table is substantially reduced during the time when said guide shoe means is positioned opposite the opposing trailing edges of the newspaper as said edges are approaching each other as the newspaper is drawn through the fold rolls.

4,545,783

RIGID MEDICAL SOLUTION CONTAINER

Thomas L. Vaughan, Valley Center, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 11, 1983, Ser. No. 512,817
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—259 **5 Claims**



4. A sterilizable container for use in the administration of a medical solution to a patient which comprises:

a semi-rigid carton formed with a reservoir and an enclosure, said reservoir having a fill spout and an output port, and said enclosure having an opening is disposed in a surrounding relationship to said output port;

a cap having an air passage therethrough removably associated with said fill spout;

a filtered vent, to provide a bacterial seal, operatively associated with said cap for rotation between an open position to allow air communication between said reservoir and said vent via said air passage and a closed position to prevent fluid communication between said reservoir and said vent through said air passage;

a tubing set, adapted to be coilably received in said enclosure and removed therefrom, attached in fluid communication with said output port for conveying the medical solution from said reservoir to the patient;

a drip chamber having an integral valve for controlling fluid flow therethrough; and

a gas permeable tear strip removably attached to said container to form a bacterial seal over the opening of said enclosure for holding said tubing set in said enclosure.

4,545,784

PARTICULATE SODIUM PERBORATE MONOHYDRATE CONTAINING ADSORBED ACTIVATOR

William R. Sanderson, Warrington, England, assignor to Interox Chemicals Limited, London, England

Filed Apr. 9, 1984, Ser. No. 598,197

Claims priority, application United Kingdom, Apr. 14, 1983, 8310080

Int. Cl.[4] C11D 3/39, 7/54

U.S. Cl. 8—107 32 Claims

1. A composition comprising particulate sodium perborate monohydrate having adsorbed therein one or more O-acyl or N-acyl bleach activators.

4,545,785

REACTIVE DYES, PROCESS FOR THEIR PREPARATION AND THE USE THEREOF

Herbert Seiler, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

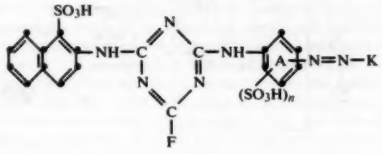
Filed Apr. 10, 1984, Ser. No. 598,566

Claims priority, application Switzerland, Apr. 15, 1983, 2039/83

Int. Cl.[4] C09B 62/08; D06P 3/66, 1/38

U.S. Cl. 8—549 12 Claims

1. A reactive dye of the formula



wherein K is a naphtholsulfonic acid or N-acylated amino-naphtholsulfonic acid, n is 1, or 2, and ring A may contain further substituents.

4,545,786

APPARATUS FOR GASIFYING SOLID CARBONACEOUS MATERIALS

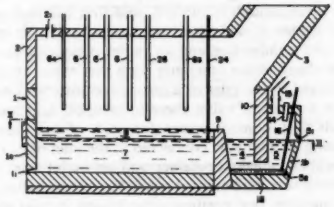
Toyosuke Tanoue; Masanobu Sueyasu; Mitsuichiro Fukuda, all of Osaka, and Tohru Matsuo, Amagasaki, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Division of Ser. No. 404,322, Jul. 30, 1982, Pat. No. 4,459,137, which is a continuation of Ser. No. 107,316, Dec. 26, 1979, abandoned. This application Dec. 23, 1983, Ser. No. 564,909

Claims priority, application Japan, Dec. 26, 1978, 53-164186

Int. Cl.[4] C10J 3/48

U.S. Cl. 48—92 10 Claims



1. An apparatus for gasifying solid carbonaceous materials which comprises

an upwardly open reactor tank, said reactor tank including a floor and a side wall sealingly extending upwardly from said floor,

a ceiling positioned over said reactor tank, said ceiling including an inlet means through which molten iron can pass so as to be deposited in said reactor tank, and an outlet duct through which produced gas can be removed from said apparatus,

an auxiliary tank outside of said reactor tank which is connected to a portion of the side wall thereof, said auxiliary tank including a floor; the portion of the side wall of said reactor tank to which said auxiliary tank is connected being constructed to enable floating slag in said reactor tank to pass thereby into said auxiliary tank,

wall means extending downwardly into said auxiliary tank in the direction of the floor thereof, said wall means functioning to divide said auxiliary tank into a slag-settling chamber adjacent said reactor tank and a slag-discharging chamber outwardly of said slag-settling chamber; said wall means and said ceiling functioning to provide a gas-tight chamber above said reactor tank when said auxiliary tank contains slag and stored iron, and

at least one non-submerged top blowing lance sealingly extending through said ceiling to be aimed at said reactor tank, each top blowing lance including a central nozzle through which a carbonaceous powder and a carrier gas can be blown and a plurality of peripheral nozzles positioned around said central nozzle through which oxygen can be blown.

4,545,787

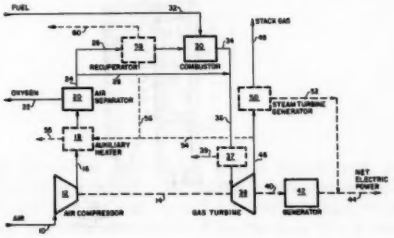
PROCESS FOR PRODUCING BY-PRODUCT OXYGEN FROM TURBINE POWER GENERATION

William P. Hegarty, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 30, 1984, Ser. No. 635,400

Int. Cl.[4] B01D 53/22, 53/04

U.S. Cl. 55—16 10 Claims



1. In a method for the generation of power in a combustion turbine and for the production of an oxygen-enriched by-product, comprising the steps of: compressing a feed airstream to an elevated pressure and temperature wherein the volume of air treated is in excess of that necessary for the combustion preceding the turbine; combusting a portion of the elevated pressure airstream with a fuel stream; bypassing another portion of the airstream around the combustion stage and quenching the combustion effluent with it; expanding the elevated pressure combustion product stream from said combustion through a turbine so as to provide power for the air compression and to recover net power from the system, the improvement comprising:

(a) separating a portion of the oxygen in the elevated pressure stream prior to expansion in the turbine while the stream is still at elevated temperature above 400° F. by passage of the stream over a semipermeable membrane which is selective to the permeation of oxygen over nitrogen; and

(b) recovering oxygen-enriched gas as a by-product stream and a resulting oxygen-depleted elevated pressure stream for expansion through said turbine.

10. In a method for the generation of power in a combustion turbine and for the production of an oxygen-enriched by-pro-

duct, comprising the steps of: compressing a feed airstream to an elevated pressure and temperature wherein the volume of air treated is in excess of that necessary for the combustion preceding the turbine; combusting a portion of the elevated pressure airstream with a fuel stream; bypassing another portion of the airstream around the combustion stage and quenching the combustion effluent with said bypassed portion; expanding the elevated pressure combustion product stream from said combustion through a turbine so as to provide power for the air compression and to recover net power from the system, the improvement comprising:

(a) separating a portion of the oxygen in the elevated pressure stream prior to expansion in the turbine while the stream is still at elevated temperature above 400° F. by passage of the stream through switching beds of an adsorbent selective to the retention of oxygen over nitrogen in a pressure and/or temperature swing adsorption cycle, and

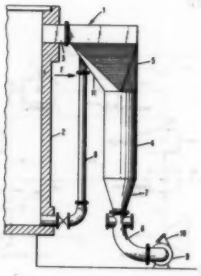
(b) recovering oxygen-enriched gas as a by-product stream and a resulting oxygen-depleted elevated pressure stream for expansion through said turbine.

4,545,788

PROCESS AND APPARATUS FOR DISCHARGING AND DEGASSING A SLURRY FROM AN ATTACK TANK

Guy Nineuil, Bihorel, France, assignor to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Jun. 7, 1984, Ser. No. 618,125
Claims priority, application France, Jun. 7, 1983, 83 09398
Int. Cl.⁴ B01D *19/00*
U.S. Cl. 55—52 **9 Claims**



1. A process for discharging and degassing a slurry from an attack tank in the production of phosphoric acid, comprising the steps of:

discharging a first slurry portion from an overflow at an upper part of the attack tank;

conducting said discharged first slurry portion as a flow of small thickness without interruption along a downwardly inclined connecting surface and with a substantially constant flow rate into a container which communicates with a pump;

discharging a second slurry portion from a lower part of the attack tank; and

combining said second slurry portion with said flow of small thickness before said flow enters said container.

4,545,789

REMOVAL OF ORGANIC RESIDUE FROM FIBER MIST ELIMINATOR

Stephen M. Lato, Baton Rouge, La., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 605,522, Apr. 30, 1984, abandoned.
This application Apr. 8, 1985, Ser. No. 720,056
Int. Cl.⁴ B01D *37/00*
U.S. Cl. 55—71 **4 Claims**

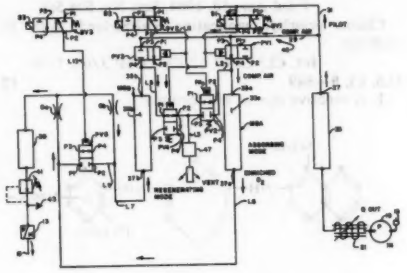
1. A method of removing chlorinated organic material fouling fiber mist eliminator elements used in the filtering of a gas stream in the chemical process industry which comprises treating the fouled elements after removal from its position of filtering the gas stream with a heated, dilute aqueous caustic solution consisting essentially of water and alkali metal hydroxide to remove the chlorinated organic material said dilute caustic solution is at a temperature of from 50° C. to about 66° C. and has a strength of from about 0.01% to about 10%.

4,545,790

OXYGEN CONCENTRATOR

Gregory R. Miller, and Steven G. Clark, both of St. Louis County, Mo., assignors to Bio-Care, Incorporated, St. Louis County, Mo.

Filed Aug. 11, 1983, Ser. No. 521,999
Int. Cl.⁴ B01D *53/04*
U.S. Cl. 55—161 **1 Claim**



1. An apparatus for producing oxygen-enriched air for breathing comprising an air compressor for pressuring air to a super atmospheric pressure, at least a first and a second adsorbent means for adsorbing nitrogen from the super atmospheric air passing therethrough and for discharging oxygen-enriched air, each said adsorbent means including a closed container having inlet and outlet ports and having a bed of adsorbent material therein, and means for controlling the flow of super atmospheric air and oxygen-enriched air through said first and second adsorbent means so as to selectively operate the adsorbent means either in an adsorbtion mode for capturing and retaining nitrogen from the super atmospheric air flowing from the inlet to the outlet ports thereof, or in a regenerating mode for removal of the nitrogen from the adsorbent bed therein, said flow control means for each of the adsorbent means comprising first and second remotely operated two-positional valves, said first valve of each flow control means for each of said adsorbent means having an open position in which air may flow therethrough and a closed position in which the flow of air therethrough is blocked, said first valve of each flow control means of said adsorbent means having an inlet connected to said compressor and an outlet connected to its respective adsorbent means container such that super atmospheric air is directed to the inlet of a respective adsorbent means when its first respective valve therefor is open, said second valve of each flow control means for each of said adsorbent means having an inlet port connected to the inlet of its respective said adsorbent means container and an outlet port vented to the atmosphere, said control means further including a third three-connection, two-position valve having its inlet and outlet ports connected between the outlets of each of said adsorbent means, said third valve being selectively shiftable between an open position in which flow therethrough is permitted and a closed position in which the flow therethrough is blocked, a throttling orifice in each of the lines in communication with the outlet of each of said respective adsorbent means containers, and an outlet container for receiving enriched oxygen air from said throttling orifices, each throttling orifice permitting oxygen

enriched air to flow under pressure from the adsorbent means in its adsorption mode to the outlet container and also to continuously exert pressure of the enriched oxygen air from the outlet container and against the outlet of its respective adsorbent means container, and to allow said air to flow to the other adsorbent means container during its regenerative mode, the inlet and outlet ports of said third valve being connected to said adsorbent means containers' outlets intermediate said containers and said orifices, said flow control means further including means for selectively actuating said pair of first valves, the pair of second valves, and the third valve, so that with said first adsorbent means in its adsorbent mode, and with said second adsorbent means in its regenerative mode, said first valve for said first adsorbent means is open thereby to permit super atmospheric air to flow into said first adsorbent means and to permit enriched oxygen air to be discharged out of said first adsorbent means, said second valve for said first adsorbent means being closed, said first valve for said second adsorbent means being closed, said second valve for said second adsorbent means being open, and said third valve being closed whereby enriched oxygen air from said first adsorbent means flows from the outlet thereof and is metered by at least one of said throttling orifices as it flows to the said second adsorbent means thereby to purge said second adsorbent means and to be discharged to the atmosphere via the outlet of said second valve for said second adsorbent means, and upon said control system effecting a change of operating mode of said first absorbent means from its adsorbing mode to its regenerating mode and effecting changing of said second adsorbent means from its regenerative mode to its adsorbing mode, said control means first effecting momentary opening of said third valve thereby to permit oxygen-enriched super atmospheric air from the outlet of said first adsorbent means to enter the outlet of said second adsorbent means thereby to precharge said second adsorbent means with oxygen-enriched air, and then effecting closing of said first valve for said first adsorbent means, opening said second valve for said first adsorbent means, opening said first valve of said second adsorbent means, closing said second valve for said second adsorbent means, and closing said third valve.

4,545,791

VENTED LIQUID RESERVOIR

Ludwig Schweikl, Moosburg, and Olaf Krauss, Karlsfeld, both of Fed. Rep. of Germany, assignors to MTU Motoren-Und-Turbinen Union Munchen GmbH, Munich, Fed. Rep. of Germany

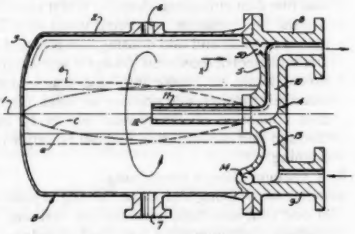
Continuation of Ser. No. 331,441, Dec. 16, 1981, abandoned.

This application Sep. 7, 1984, Ser. No. 648,651

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047719

Int. Cl.[4] B01D *19/00;* **F16K** *17/36*

U.S. Cl. 55—182 **22 Claims**



1. A reservoir for holding a liquid for use in an aircraft which is subjected to extreme flight attitudes, the reservoir comprising:

a wall rotationally symmetrical about the longitudinal axis of the reservoir,

a liquid extraction port located in proximity to said wall,

means for rotating the liquid content of the reservoir about the longitudinal axis, to provide a central space within the reservoir which is essentially free of liquid, and to maintain the liquid within the reservoir in constant contact with the extraction port, and

venting means for the reservoir including an air extraction port located along the longitudinal axis of the reservoir and at about the longitudinal center of the reservoir so that when the reservoir is about half full and the liquid in the reservoir is static the air extraction port remains above the liquid level regardless of the orientation of the reservoir.

4,545,792

DEVICE AND PROCESS FOR PRECIPITATING FOREIGN MATTER FROM A GAS STREAM

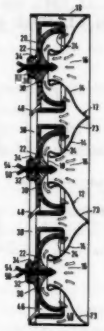
Herbert Hüttlin, Steinen, Fed. Rep. of Germany, assignor to Condair AG, Switzerland

Filed Feb. 27, 1984, Ser. No. 584,110

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1983, 3307048

Int. Cl.[4] B01D *45/16, 47/06*

U.S. Cl. 55—241 **4 Claims**



1. A device for precipitating foreign matter from gas streams, with at least one crossflow precipitator unit, comprising an inlet duct for a gas stream laden with foreign matter bounded by a baffle element which has the shape of a Venturi tube and is provided with a steadying bead at its mouth, further comprising a concave, rotationally symmetrical impingement surface which is disposed coaxially to this inlet duct and is curved at a distance around the mouth of the inlet duct and which has a conical tapered flow distributor projecting from the center thereof towards the baffle element, whereby the space between the flow distributor with its impingement surface and the baffle element constitutes an annular space for a flow path leading to the back of the baffle element, wherein

(a) the impingement surface is curved around the steadying bead to such an extent that the mouth of the steadying bead extends to some extent into the space formed by the concave impingement surface and is enclosed by the radial outer edge of said impingement surface and such that the impingement surface surrounds the rear mouth end of the associated baffle surface at a radial distance, and

(b) an annular collecting element is provided surrounding the periphery of the impingement surface and forming therewith an annular collecting chamber and with its internal edge surface this collecting element extends from the periphery into said annular space, by a radial distance (h) from the outer radial edge of the impingement surface which radial distance amounts to less than the radial distance between the outer edge of the impingement surface and the opposite radial edge of the mouth of the steadying

bead, providing thereby an annular gap for introducing foreign matter, and

(c) an outflow duct is provided surrounding the collecting chamber virtually coaxially and serving for the escape of the major portion of the purified gas stream, and

(d) wherein the said flow distributor has a central opening through which both a liquid line and, concentrically thereto, a compressed air-line, are taken right into the mouth region of the baffle element, the liquid line having at its end associated with the distributor a spray nozzle, and the compressed-air line leading into a ring nozzle which surrounds the spray nozzle, and the spray nozzle and the ring nozzle being covered at a distance by a hollow conical cap which also forms the center of the distributor and which, between its free edge and the neighboring surface of the flow distributor leaves a free annular space which is open in the direction of the curved impingement surface.

4,545,793

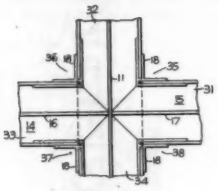
AIR FILTER SYSTEM WITH SUPPORTING AND SEALING GRID

Bernard R. Shuler, Louisville, Ky., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1983, Ser. No. 564,570

Int. Cl.[4] B01D *46/00*

U.S. Cl. 55—355 **4 Claims**



1. An air filter system comprising:

A. a latticework supported from the ceiling of a room;

B. said latticework formed by main filter support members and cross filter support members extending lengthwise and crosswise of said room to define a plurality of filter receiving openings;

C. said main filter support members and cross filter support members each having walls defining a fluid tight channel which receives a fluid sealant;

D. a filter element mounted in each filter receiving opening and having flanges extending downwardly into said fluid sealant; and wherein the improvement comprises:

E. said main filter support members and cross filter support members each having a center wall and two side walls spaced from said center wall, said walls all extending upwardly from a bottom wall to define first and second adjacent fluid sealant retaining channel chambers;

F. said center wall of each of said main filter support members being connected in fluid tight relation only to the center walls of said abutting cross filter support members;

G. said side walls of said main filter support members being connected in fluid tight relation only to the side walls of abutting cross filter support members; and

H. said center wall and side wall fluid tight connections creating a fluidally continuous, upwardly open individual channel chamber around the periphery of each individual filter receiving opening with each of said peripheral channel chambers being independent of and not in fluid communication with any of the other peripheral channel chambers thereby requiring that only each individual channel chamber be level when in an installed position and permitting withdrawal of any individual filter element and its associated flanges without disturbing the fluid sealant around the flanges of adjacent filter elements.

4,545,794

VACUUM CLEANER

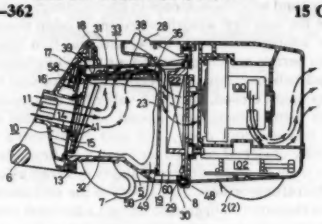
Mamoru Himukai, Kasai, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 5, 1982, Ser. No. 439,538

Claims priority, application Japan, Nov. 13, 1981, 56-182913; Jan. 11, 1982, 57-3184; Feb. 24, 1982, 57-29564

Int. Cl.[4] B01D *46/00, 50/00*

U.S. Cl. 55—362 **15 Claims**



1. A vacuum cleaner comprising:

a body case defining a chamber having at least one opening at one end, said body case further defining an air outlet opening communicating with said chamber;

an electric-powered blower secured in said body case;

a dust case defining a coarse dust collecting chamber open at both ends;

means for releasably securing said body case to said dust case with one open end of said dust case in abutting confronting relation with said one end of said body case;

a primary air permeable filter secured in said dust case so as to partially define said coarse dust collecting chamber;

a lid having an air intake therein; and means for hingedly securing said lid to said dust case for movement between a closed position wherein the other open end of said dust case is covered by said lid and an open position wherein said other open end is exposed;

a filter housing unit defining a fine dust collecting chamber;

a second air permeable filter secured in said filter housing unit; and

means for hingedly attaching said filter housing unit to said dust case for movement between a first position wherein said housing unit overlies said one open end of said dust case, and a second position wherein said one open end is exposed, said housing unit having an opening therein for communicating said coarse dust collecting chamber with said fine dust collecting chamber when said housing unit is in said first position, whereby when said lid is in said closed position and said housing unit is in said first position and said electric-powered blower is activated, air is drawn through said air intake into said coarse dust collecting chamber, through said primary air filter, through said fine dust collecting chamber, into said body case chamber through said second filter, and out through said air outlet opening.

8. A vacuum cleaner comprising:

a body case defining a chamber having at least one opening at one end, said body case further defining an air outlet opening communicating with said chamber;

an electric powered blower secured in said body case;

a dust case defining a coarse dust collecting chamber open at both ends;

means for releasably securing said body case to said dust case with one open end of said dust case in abutting confronting relation with said one end of said body case;

a primary air permeable filter secured in said dust case so as to partially define said coarse dust collecting chamber;

a lid having an air intake therein; and means for hingedly securing said lid to said dust case for movement between a closed position wherein the other open end of said dust case is covered by said lid and an open position wherein said other open end is exposed, the inner surface of said lid including a bag-mouth plate fitting means for receiving a dust bag when used;

a housing unit defining a fine dust collecting chamber; means for hingedly attaching said housing unit to said dust case for movement between a first position wherein said housing unit overlies said one open end of said dust case and a second position wherein said one open end of said dust case is exposed, said housing unit having an opening therein for communicating said fine and coarse dust collecting chambers when said housing unit is in said first position; and

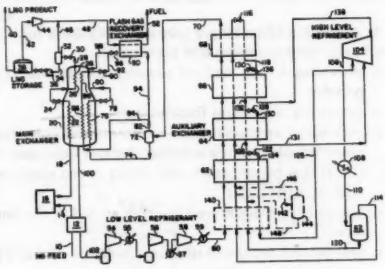
bag-mouth holding means for releasably securing said dust bag when used to said fitting means; and

said housing unit defining means cooperating with said bag-mouth holding means for releasing the dust bag when used from the mouth plate fitting means to permit removal of said dust bag through said one end of said dust case when said dust case is released from said body case.

4,545,795
DUAL MIXED REFRIGERANT NATURAL GAS LIQUEFACTION

Yu-Nan Liu, Whitehall, and James W. Pervier, West Chester, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 25, 1983, Ser. No. 545,409
Int. Cl.[4] F25J *1/02*
U.S. Cl. 62—11 **13 Claims**



1. A process for the liquefaction of natural gas using two closed cycle, multicomponent refrigerants wherein high level refrigerant cools a low level refrigerant and the low level refrigerant cools and liquefies the natural gas, comprising the steps of:

a. cooling and liquefying a natural gas stream by heat exchange with a low level multicomponent refrigerant in a first closed refrigeration cycle, which refrigerant is rewarmed during said heat exchange,

b. compressing said rewarmed low level refrigerant to an elevated pressure and aftercooling it against an external cooling fluid,

c. further cooling said low level refrigerant by indirect multiple stage heat exchange against a high level multicomponent refrigerant in a second closed refrigeration cycle, which high level refrigerant is rewarmed during said heat exchange,

d. compressing said rewarmed high level refrigerant to an elevated pressure and aftercooling it against an external cooling fluid to partially liquefy said refrigerant,

e. phase separating said high level refrigerant into a vapor phase refrigerant stream and a liquid phase refrigerant stream such that lighter refrigerant components are available for lower level refrigeration duty in the cooling step of clause c,

f. subcooling and expanding portions of the liquid phase refrigerant stream to lower temperature and pressure in multiple stages to provide the cooling of the low level refrigerant of step (c) and to cool and liquefy the vapor phase refrigerant stream of step (e),

g. cooling and then expanding the liquefied vapor phase refrigerant stream to lower temperature and pressure to provide the lowest stage of cooling to the low level refrigerant.

10. An installation for the liquefaction of natural gas using two closed cycle, multicomponent refrigerants wherein high level refrigerant cools a low level refrigerant and the low level refrigerant cools and liquefies the natural gas, comprising:

a. a heat exchanger for cooling and liquefying natural gas against a low level refrigerant;

b. at least one compressor for compressing the low level refrigerant to an elevated pressure;

c. an auxiliary heat exchanger for indirectly cooling the low level refrigerant against high level refrigerant in multiple stages;

d. a phase separator for separating the low level refrigerant into a vapor phase stream and a liquid phase stream;

e. means for conveying the vapor phase stream and the liquid phase stream separately to said heat exchanger of paragraph (a) and recycling same to said compressor of paragraph (b);

f. at least one compressor for compressing high level refrigerant to an elevated pressure;

g. an aftercooling heat exchanger for cooling the compressed high level refrigerant against an external cooling fluid;

h. a phase separator for separating the high level refrigerant into a vapor phase stream and a liquid phase stream such that lighter refrigerant components are available for lower level refrigeration duty in the auxiliary heat exchanger of clause c;

i. means for conveying said high level vapor phase stream through said auxiliary heat exchanger and expanding said stream in order to provide the lowest stage of cooling to the low level refrigerant stream;

j. means for conveying said high level liquid phase stream through said auxiliary heat exchanger including means for separating portions of said stream therefrom and then individually expanding them to a lower temperature and pressure to cool said low level refrigerant;

k. means for recycling the high level refrigerant for recompression.

4,545,796
SPINNER DEVICE FOR ROTARY PRODUCTION OF FIBERS

E. Eugene Crosby, Reynoldsburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 21, 1984, Ser. No. 581,924
Int. Cl.[4] C03B *37/05*
U.S. Cl. 65—15 **10 Claims**

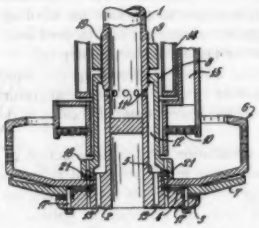
1. Apparatus for the rotary production of fibers from molten glass which comprises:

(a) a rotatable drive shaft having at least one flange proximate one terminus;

(b) a spinner positioned circumferentially to said shaft and in contact with one of said flanges; and,

(c) bearing means slideably positioned on said shaft and in bearing relationship to said spinner to compress said spin-

ner against said flange to cause said spinner to rotate in unison with said rotatable drive shaft, said bearing relationship being effected without having said bearing means pass through the bottom wall of said spinner.



4,545,797

PROCESS FOR MANUFACTURING POROUS SLAG

Azza A. Elattar, Wappingers Falls, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,972
Int. Cl.⁴ C03C *15/00*
U.S. Cl. 65—19 **6 Claims**

1. A process for treating an inert glassy slag having a low surface area which comprises

treating an inert glassy slag having a low surface area in a one-step operation in the presence of (i) base having a pK_b of about 2-6 or (ii) acid having a pK_a of about <1-5 thereby forming a treated slag of increased surface area; and

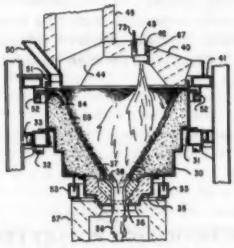
recovering said treated slag of increased surface area.

4,545,798

ABLATING LIQUEFACTION EMPLOYING PLASMA

Joseph M. Matesa, Plum Boro, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 2, 1983, Ser. No. 500,542
Int. Cl.⁴ C03B *5/10*
U.S. Cl. 65—27 **15 Claims**



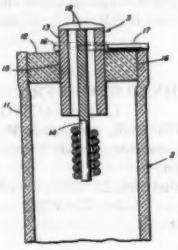
1. A method of continuously liquefying a stream of pulverulent glassmaking material comprising: directing a stream of free-flowing, solid, thermally meltable, pulverulent, glassmaking material into a liquefaction vessel onto a sloped lining on side wall portions of the vessel encircling a central cavity of the vessel, directing a plasma stream having a temperature of at least 5000° K. into the cavity whereby the pulverulent material is liquefied at a temperature no greater than 1315° C. and flows down the sloped surface of the lining and out of the vessel through a drain opening at a bottom portion of the cavity, the liquefied material being permitted to drain freely so that the material flows from the vessel before it becomes fully melted, and maintaining the rate of draining and the rate of feeding the pulverulent material onto the lining sufficient to cool the lining so that a stable layer of the lining is retained essentially unliquefied with a thickness sufficient to insulate the side wall portions of the vessel from heat in the cavity so that integrity of the side wall portions is maintained during continuous operation without forced external cooling.

4,545,799

METHOD OF MAKING DIRECT SEAL BETWEEN NIOBIUM AND CERAMICS

William H. Rhodes, Lexington; Caryl S. Pitt, Natick, and John J. Gutta, North Andover, all of Mass., assignors to GTE Laboratories Incorporated, Waltham and GTE Products Corporation, Danvers, both of, Mass.

Filed Sep. 6, 1983, Ser. No. 529,464
Int. Cl.⁴ C03C *29/00*
U.S. Cl. 65—59.21 **1 Claim**



1. A method of making a tube assembly for a high pressure discharge lamp comprised of the steps of:

a. providing a tube made of unsintered compressed ceramic powder

b. providing a niobium feedthrough;

c. providing an insert made of unsintered compressed ceramic powder having a similar thermal expansion coefficient as that of said tube, said insert in the shape of a disc with an axial hole;

d. inserting said unsintered insert in an end of the unsintered tube;

e. heating said insert and tube until both are partially sintered and bonded together;

f. positioning said niobium feedthrough in the axial hole of said insert; and

g. heating said tube, insert and niobium feedthrough until said tube and insert are fully sintered and said insert is contracted and forced against said niobium feedthrough, forming thereby a brazeless, fritless hermetic seal at the interface between said insert and said niobium feedthrough.

4,545,800

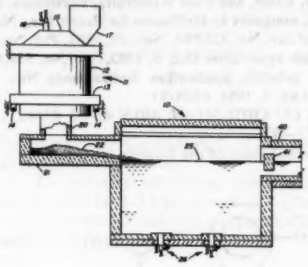
SUBMERGED OXYGEN-HYDROGEN COMBUSTION MELTING OF GLASS

Kwang J. Won, Murraysville, and George A. Pecoraro, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 19, 1984, Ser. No. 632,506
Int. Cl.⁴ C03B *5/16*
U.S. Cl. 65—134 **17 Claims**

1. A method of heating a body of melting glass or the like by submerged combustion wherein combusting gas is injected into the body of the melting material from beneath its surface, the submerged combustion comprising combustion of fuel that is predominantly hydrogen and an oxidant that is predominantly

oxygen, whereby the product of the submerged combustion introduced into the melting body is predominantly water va-



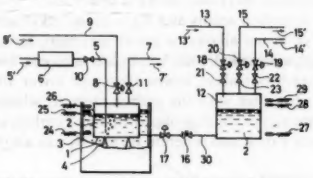
por, thereby reducing the creation of bubbles in the melting body.

4,545,801

RAW MATERIAL SUPPLY DEVICE

Tetsuo Miyajiri; Toshimi Habasaki; Hiroshi Yokota; Tamio Tsurita, all of Osaka, and Motohiro Nakahara, Ibaraki, all of Japan, assignors to Sumitomo Electric Industries, Ltd. and Nippon Telegraph & Telephone Public Corporation, both of, Japan

Filed Feb. 6, 1984, Ser. No. 577,419
Int. Cl.⁴ C03P *37/00*
U.S. Cl. 65—157 **7 Claims**



1. A raw material supply device for supplying a glass-forming raw material gas in the form of a mixed gas consisting of said glass-forming raw material gas and a carrier gas to a vapor deposition device for producing a preform of an optical fiber, the supply device comprising: a pressurized main raw material container having means for supplying said glass-forming gas as said mixed gas from said main raw material container to said vapor deposition device for producing a preform, a secondary raw material container having a pressurizable interior and means to pressurize said interior, said secondary container being provided adjacent to said pressurized main raw material container, means for providing liquid glass-forming raw material to said secondary raw material container, pipe means for conveying raw material liquid phase portions from said secondary container to said main container, said pipe means connected to both of said containers at their respective bottoms or substantially at said bottoms, said pipe means comprising a first pipe including a switching valve at a mid portion of said pipe, means for opening and closing said switching valve in response to fluid level in said main container, and means for adjusting the flow rate of the raw material liquid into said main container, such that the flow into the main container is controlled relative to the flow of raw material out of the main container.

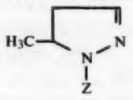
4,545,802

SOIL TREATING METHOD AND COMPOSITION FOR CONSERVING NITROGEN IN SOIL

Ronald W. McCormick, and Richard B. Rogers, both of Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1984, Ser. No. 624,426
Int. Cl.⁴ C05G *3/08*
U.S. Cl. 71—27 **9 Claims**

1. A composition which comprises a reduced nitrogen fertilizer in admixture with from about 0.05 to about 98 percent by weight of an active agent which is 5-methyl-2-pyrazoline or a pyrazoline compound which corresponds to the formula



wherein Z represents alkylcarbonyl, alkylcarboxyl, alkylthiocarboxyl, N,N-dialkylcarbamoyl, N,N-dialkylthiocarbamoyl or alkylsulfonyl wherein the term alkyl independently represents a straight or branched chain alkyl group of 1 to 4 carbon atoms, inclusive or a cyclic alkyl group of 3 or 4 carbon atoms, inclusive.

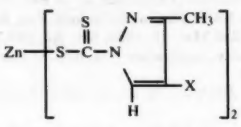
4,545,803

SOIL TREATING METHOD AND COMPOSITION FOR CONSERVING NITROGEN IN SOIL

Kim E. Arndt, Pittsburg; Richard B. Rogers, and Ronald W. McCormick, both of Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1984, Ser. No. 624,429
Int. Cl.⁴ C05G *3/08;* C07F *3/06*
U.S. Cl. 71—27 **20 Claims**

1. A zinc bis(pyrazole-1-carbodithioate) corresponding to the formula



wherein X represents hydrogen, bromo, chloro or methyl.

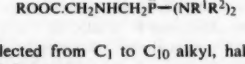
4,545,804

N(AMINOPHOSPHINYLMETHYL) GLYCINE DERIVATIVES

John E. Franz, Crestwood, and Robert J. Kaufman, University City, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 21, 1983, Ser. No. 553,597
Int. Cl.⁴ E05B *65/46;* C07F *9/22*
U.S. Cl. 71—86 **6 Claims**

1. A compound having the formula:



(a) R is selected from C_1 to C_{10} alkyl, haloalkyl and alkyloxyalkyl groups;
(b) each R^1 is individually selected from hydrogen and C_1 to C_6 alkyl groups; and
(c) each R^2 is individually selected from hydrogen and C_1 to C_6 alkyl groups.

5. A composition comprising a herbicidally effective amount of a compound according to claim 1 and an inert adjuvant.

4,545,805

HERBICIDE COMPOSITIONS OF EXTENDED SOIL LIFE

Angelo J. Bufalini, San Francisco, and Edmund J. Gaughan, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

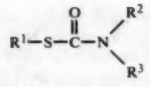
Continuation of Ser. No. 361,309, Mar. 24, 1982, abandoned. This application Sep. 12, 1983, Ser. No. 531,192

Int. Cl.⁴ A01N *37/02*

U.S. Cl. 71—87 **12 Claims**

1. An herbicidal composition comprising

(a) an herbicidally effective amount of a thiolcarbamate having the formula



in which R^1, R^2, and R^3 are independently C_1–C_6 alkyl; and

(b) an amount of 1,4-dioxanemethyldiethyl thionophosphate sufficient to extend the soil life of said thiolcarbamate.

4,545,806

5-(OXO OR THIO HETEROCYCLE) CYCLOHEXANE-1,3-DIONE DERIVATIVES AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Dieter Jahn, Edingen-Neckarhausen; Rainer Becker, Bad Durkheim; Michael Keil, Freinsheim; Wolfgang Spiegler, Worms, and Bruno Wuerzer, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

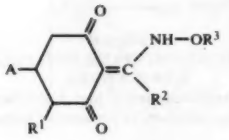
Filed Mar. 15, 1984, Ser. No. 589,770

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310418

Int. Cl.⁴ A01N *43/74, 43/40;* **C07D** *213/63, 215/22*

U.S. Cl. 71—88 **10 Claims**

1. A cyclohexane-1,3-dione derivative of the formula



(I)

where A is, 2(1-H)-pyridonyl, 2(1H)-pyridinethionyl, piperidonyl, oxoquinolyl, thioxoquinolyl, pyrazolinolyl, oxobenzoxazinyl, oxobenzthiazinyl and oxoindolinyl and said heterocyclic groups substituted by not more than 3 alkyl radicals of not more than 4 carbon atoms, hydroxyl, alkoxy of not more than 4 carbon atoms or unsubstituted phenyl, R^1 is hydrogen, methoxycarbonyl, ethoxycarbonyl, methyl or cyano, R^2 is alkyl of 1 to 4 carbon atoms and R^3 is alkyl of 1 to 3 carbon atoms, alkenyl of 3 or 4 carbon atoms, haloalkenyl which has from 1 to 3 halogen substituents and where alkenyl is of 3 or 4 carbon atoms, or propargyl, and salts thereof.

5. A herbicidal composition containing inert additives and an effective amount of cyclohexane-1,3-dione derivative of the formula I as defined in claim 1, or a salt thereof.

4,545,807

OXIME ESTER HERBICIDES

Georg Fráter, Greifensee; Milos Suchy, Pfaffhausen; Jean Wenger, Uster, and Paul Winternitz, Greifensee, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

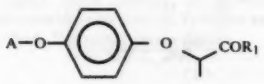
Division of Ser. No. 323,784, Nov. 23, 1981, Pat. No. 4,435,207. This application Dec. 5, 1983, Ser. No. 558,150

Claims priority, application Switzerland, Nov. 26, 1980, 8750/80; Oct. 1, 1981, 6328/81

Int. Cl.⁴ C07D *241/44;* **A01N** *43/60, 43/40, 43/42*

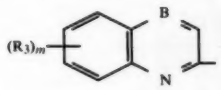
U.S. Cl. 71—92 **10 Claims**

1. An oxime ester of the formula



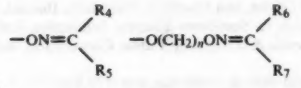
I

wherein A is



Ib

in which R_3 is hydrogen, halogen or trifluoromethyl, m is 1 or 2 B is nitrogen, and wherein R_1 is one of the groups



Ic Id

R_4 and R_5 are lower alkylcarbonyloxy-lower alkyl, lower alkoxy or lower alkyl-thio or R_4 is lower alkyl or cycloalkyl with 3 to 6 carbon atoms and R_5 is lower alkylcarbonyloxy-lower alkyl, lower alkoxy or lower alkylthio, R_6 and R_7 are lower alkyl, cycloalkyl with 3 to 6 carbon atoms, lower alkylcarbonyloxy-lower alkyl, lower alkoxy or lower alkylthio or R_6 and R_7 together with the carbon atom to which they are attached are a cycloalkyl group with 3 to 7 carbon atoms, and wherein n is 1 or 2, and wherein R_4 and R_6 can also be hydrogen.

7. A herbicidal composition which comprises an inert carrier material, and as the active ingredient, an amount of one or more of the compounds of claim 1 which is effective as a herbicide.

4,545,808

HERBICIDAL SULFONAMIDES, COMPOSITIONS AND USE

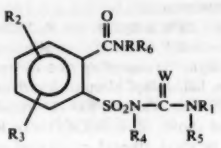
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 98,781, Nov. 30, 1979, Pat. No. 4,394,506, which is a continuation-in-part of Ser. No. 29,281, Apr. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 15,341, Mar. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 965,070, Nov. 30, 1978, abandoned, which is a cbntinuation-in-part of Ser. No. 910,965, May 30, 1978, abandoned. This application Mar. 30, 1983, Ser. No. 480,591

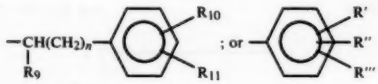
Int. Cl.⁴ A01N *47/36;* **C07D** *239/46, 239/52, 413/12*

U.S. Cl. 71—92 **24 Claims**

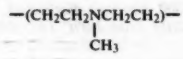
1. A compound selected from



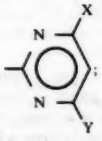
wherein
R is H; C_1–C_{12} alkyl; C_3–C_{10} alkenyl; C_3–C_6 alkynyl; C_3–C_8 cycloalkyl; C_5–C_6 cycloalkenyl;
R is also C_5–C_8 cycloalkyl substituted with 1 to 3 substituents selected from (a) 1–3 CH_3 groups or (b) C_2H_5;
R is also C_4–C_{10} cycloalkylalkyl; C_4–C_8 cycloalkyl substituted with 1–2 CH_3groups;
R is also



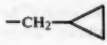
wherein
n is 0, 1, 2 or 3;
R_9 is H or C_1–C_3 alkyl;
R_{10} is H or C_1–C_3 alkyl;
R_{11} is H or C_1–C_3 alkyl;
R′ is H or C_1–C_4 alkyl;
R″ is H or C_1–C_4 alkyl;
R‴ is H or CH_3;
R_6 is H; C_1–C_6 alkyl; or allyl; or R and R_6 may be taken together to form —$(CH_2)_4$—, —$(CH_2)_5$—, —$(CH_2)_6$—, —$(CH_2CH_2OCH_2CH_2)$— or



provided that
R and R_6 have a total number of atoms less or equal to 13;
R_1 is



R_2 is H, Cl, Br, F, C_1–C_3 alkyl, NO_2, SO_2CH_3, OCH_3, SCH_3, CF_3, $N(CH_3)_2$, NH_2 or CN:
R_3 is H, Cl, Br, F or CH_3;
R_4 is H or CH_3;
R_5 is H or CH_3;
W is O or S;
X is H, Cl, CH_3, OCH_3, OCH_2CH_3 or $OCH_2CH_2OCH_3$; and
Y is H, C_3–C_4 alkenyl, or $CH_2C{\equiv}CR_{13}$, R, Cl, Br, C_1–C_4 alkyl or OR_{14} wherein
R_{13} is H, CH_3 or CH_2Cl;
R_{14} is C_1–C_4 alkyl, C_3–C_4 alkenyl, $CH_2C{\equiv}CR_{13}$, or



provided that
(a) when Y is equal to 4 carbon atoms, then R is less than or equal to 4 carbon atoms; and
(b) when X is Cl, then Y is Cl; and when X and Y are both H, then R is less than or equal to 4 carbon atoms.

17. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected a herbicidally effective amount of a compound of claim 1.

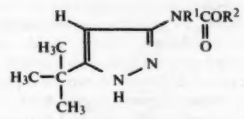
4,545,809

HERBICIDAL N-(5-T-BUTYL-3-PYRAZOLYL) CARBAMATES

Nansho Seki; Yuki Yamaguchi; Yukihiro Nakamura; Hiroshi Kubo, and Tetsuo Tsuruya, all of Tokyo, Japan, assignors to SDS Biotech K.K., Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 623,880
Claims priority, application Japan, Jun. 23, 1983, 58-111894
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] A01N *43/56;* **C07D** *231/38, 231/40*
U.S. Cl. 71—92 **6 Claims**

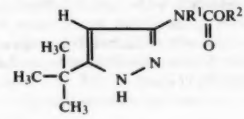
1. A pyrazole derivative represented by the formula (I):



(I)

wherein R^1 and R^2 each represents an alkyl group having 1 to 4 carbon atoms.

5. A method for controlling noxious weeds comprising applying to plants or a locus, a herbicidally effective amount of a pyrazole derivative represented by the formula (I):



(I)

wherein R^1 and R^2 each represents an alkyl group having 1 to 4 carbon atoms.

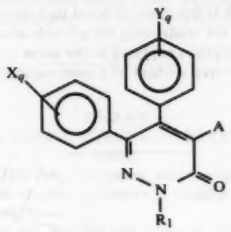
4,545,810

HERBICIDAL AND PLANT GROWTH REGULANT DIPHENYLPYRIDAZINONES

William J. Pyne, Painesville; John Lowbridge, Cleveland Heights; In-Kook Chang, Painesville, all of Ohio; Florian Knotz, Graz, Austria, and Larry J. Powers, Madison, Ohio, assignors to SDS Biotech Corporation, Painesville, Ohio

Division of Ser. No. 288,531, Jul. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 176,082, Aug. 7, 1980, abandoned. This application Mar. 25, 1983, Ser. No. 478,689
Int. Cl.[4] A01N *43/58;* **C07D** *237/14*
U.S. Cl. 71—92 **8 Claims**

1. A herbicidal composition comprising a herbicidally acceptable carrier substance and a herbicidally effective amount of at least one active compound of the formula:



or the salts and the water hydrates thereof wherein the active compound is selected from the group consisting of Ethanol, 2-(5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl); Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenyl-pyridazin-1-yl; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4,-diphenylpyridazin-1-yl ethyl ester, Propionic Acid, 3-(5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl); Propionic Acid, 3-(5-cyano-1,6-dihydro-6-oxo-3,4-diphenyypyridazin-1-yl)-ethyl ester; Propionic Acid, 3-(5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl)ethoxy ethyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenyl-pyridazin-yl-methoxy ethyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-yl-2-propenyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-3-methoxy-1-butyl ester; 1-Pyridazineacetylchloride, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenyl; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-1-pentyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-2-methyl-2-propenyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-1-butyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-2-ethyl-butyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl cyclohexyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-3-methyl-3-butenyl ester; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl diethanol amine salt; Propionic Acid, 3-(5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl)potassium salt; Ethanol, 2-(5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl)phenylether; Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenylpyridazin-1-yl-2-propynyl ester; and Acetic Acid, 5-cyano-1,6-dihydro-6-oxo-3,4-diphenyl-pyridazin-1-yl-1-hexadecyl ester.

4,545,811

N-PHENYLSULFONYL-N'-TRIAZINYL-UREAS

Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

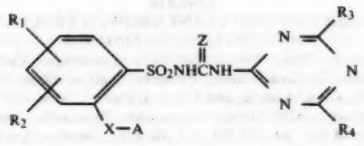
Filed Jul. 26, 1982, Ser. No. 401,583

Claims priority, application Switzerland, Aug. 6, 1981, 5075/81; Apr. 8, 1982, 2205/82

Int. Cl.[4] **C07D** *251/46, 251/42, 251/16;* **A01N** *43/66*

U.S. Cl. 71—93 **18 Claims**

1. A compound of the formula:



wherein

Z is O or S;

X is O, S, SO or SO_2;

A is (i) halogenated alkyl or halogenated alkenyl of up to 6 carbon atoms or (ii) alkyl or alkenyl of up to 6 carbon atoms substituted with an unhalogenated or halogenated alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group of up to 4 carbon atoms;

R_1 is hydrogen, halo, alkyl of up to 5 carbon atoms, or R_5—Y— in which Y is O, S, SO or SO_2; and R_5 is an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_2 is hydrogen, halo, alkyl of up to 5 carbon atoms, haloalkyl of up to 5 carbon atoms, R_5—Y— in which Y and R_5 are as defined above, nitro, R_6OCO— or R_7R_8NCO—, in which R_6 is an alkyl, alkenyl, or alkynyl group of up to 5 carbon atoms; and

each of R_7 and R_8 are hydrogen or an alkyl, alkenyl or alkynyl group of up to 5 carbon atoms;

R_3 is hydrogen, halo, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, alkylthio of up to 4 carbon atoms, haloalkyl of up to 4 carbon atoms, haloalkoxy of up to 4 carbon atoms, or alkoxyalkyl of up to 4 carbon atoms; and

R_4 is halogenated alkoxy or halogenated alkylthio of up to 4 carbon atoms.

4,545,812

DIPHENYL SULFONE COMPOUNDS, AND THEIR PRODUCTION AND USE

Hiroyuki Konishi, Sakai; Naganori Hino; Hiroshi Matsumoto, both of Toyonaka, and Ryo Yoshida, Kawanishi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 12, 1982, Ser. No. 441,381

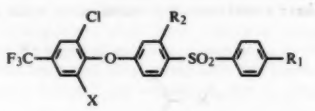
Claims priority, application Japan, May 14, 1982, 57-81750; Aug. 6, 1982, 57-137790

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.[4] **B21H** *3/04;* **C07C** *147/107, 121/50*

U.S. Cl. 71—103 **43 Claims**

1. A diphenyl sulfone compound of the formula:



(I)

wherein R_1 is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkenyloxy group, a lower alkynyloxy group or a lower alkoxycarbonyl(lower)alkoxy group, R_2 is a hydroxyl group, a lower alkenyloxy group, a lower alkynyloxy group, a halo(lower)alkoxy group, a lower alkoxy(lower)alkoxy group, a cyano(lower)alkoxy group, a lower alkoxycyano(lower)alkoxy group, a hydroxy(lower)alkoxy group, a lower alkylcarbonyloxy group, a lower alkoxycarbonyl group, a lower alkylthio(lower)alkoxy group, a lower alkenyloxy(lower)alkoxy group, a di(lower)alkylamino(lower)alkoxy group, a hydroxyimino(lower)alkoxy group, a lower alkoxyimino(lower)alkoxy group, a lower alkylsulfonyloxy group, a lower alkoxycarbonyloxy group, a di(lower)alkoxyphosphinyloxy group, an oxotetrahydrofuranyloxy group or a group of the formula: —O—A—COR_3, in which A is lower alkylene, lower alkenylene, lower alkyleneoxy or lower alkoxy(lower)alkylene and R_3 is hydroxyl, lower alkyl, lower alkoxy, lower alkenyloxy, lower alkynyloxy, halo(lower)alkoxy, lower alkoxy(lower)alkoxy, cyano(lower)alkoxy, lower alkoxycarbonyl(lower)alkoxy, di(lower)alkylamino, N-(α-lower alkyl(lower)alkylidene)aminoxy or lower alkylthio, and X is a hydrogen atom or a halogen atom.

4,545,813
3-CHLOROBENZYL-3,6-DICHLORO-2-METHOXYBENZOATE AS A CITRUS RIPENER

Louis G. Nickell, Chicago; Leonard J. Stach, Riverside, and George F. Luteri, Mount Prospect, all of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

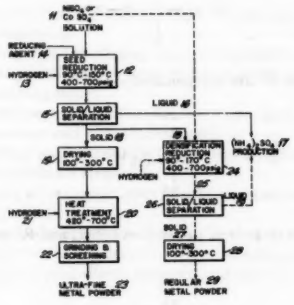
Filed Jun. 11, 1984, Ser. No. 619,087
Int. Cl.⁴ E05B *59/00*
U.S. Cl. 71—107 **7 Claims**

1. A method of increasing the recoverable sugar in citrus which comprises applying to the grapes an effective amount of 3-chlorobenzyl-3,6-dichloro-2-methoxybenzoate.

4,545,814
PRODUCTION OF COBALT AND NICKEL POWDER

Eddie C. J. Chou, and Mark W. Cooperrider, both of Arvada, Colo., assignors to AMAX Inc., Greenwich, Conn.

Filed May 23, 1984, Ser. No. 613,122
Int. Cl.⁴ C22B *23/04*
U.S. Cl. 75—0.5 AA **5 Claims**



1. In the process for producing cobalt and nickel powder by hydrogen reduction at an elevated temperature and pressure from an aqueous sulfate solution containing metal ions from the group consisting of nickel and cobalt and ammonia in the presence of a soluble catalyst, the improvement comprising using as said catalyst a compound from the group consisting of metal hydrides, metal borohydrides and metal borides in the amount of about 0.45 to about 1.9 weight percent of said metal from the group consisting of cobalt and nickel in said solution.

4,545,815
PROCESS FOR THE PRODUCTION OF STEELS OF LOW CARBON CONTENT WHEREIN THE CARBON END POINT AND BLOW TEMPERATURE ARE CONTROLLED

Lajos Tóth; Lajos Tolnay; László Kiss; István Szíklavaris; Miklós Aranyosi; László Zsiros; Ferenc Kiss, and Lajos Kiss, all of Miskolc, Hungary, assignors to Lenin Kohaszati Muvek, Hungary

Filed Aug. 14, 1984, Ser. No. 640,766
Claims priority, application Hungary, Aug. 26, 1984, 2999
Int. Cl.⁴ C21C *5/34*
U.S. Cl. 75—49 **5 Claims**

1. A process for the production of steels of low carbon content by blowing in oxygen under vacuum into the system, wherein the carbon end point and the blow temperature are controlled, the units of the system are water-cooled and the generated flue gases are discharged from the system, comprising the steps of:

(a) tapping of the steel;

(b) slag skimming of the melt;

(c) heating the melt;

(d) refining the melt under vacuum, wherein oxygen is admitted through a blow lance into the melt under high vacuum and under intensive and inductive mixing while flushing with argon;

(e) finishing and casting of the steel;

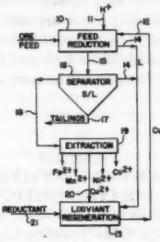
(f) continuously measuring the composition, temperature and quantity of the merging flue gases as well as the temperature and quantity of the admitted and discharged cooling water throughout the process; and

(g) controlling the oxygen blowing and inductive mixing vacuum valves, as well as the argon intensity, in response to the data obtained by the measurements according to step (f).

4,545,816
PROCESSES RELATING TO THE EXTRACTION OF METALS FROM LATERITES AND OCEAN MANGANESE NODULES

Alkis S. Rappas, Chagrin Falls, Ohio, assignor to The Standard Oil Co., Cleveland, Ohio

Filed Jun. 4, 1984, Ser. No. 616,841
Int. Cl.⁴ C22B *23/04, 15/08*
U.S. Cl. 75—101 R **61 Claims**



1. A process for the extraction of ferrous, manganous and nonferrous metals from iron oxide and manganese oxide containing ores by reduction leaching comprising the steps of:

contacting the pulverized ore with a stabilized acidic cuprous ion solution $Cu^{+}L$ in a suitable reactor at a temperature of up to about 90° C. while maintaining the pH between about 1.5 and 2.5 with acid to form a slurry, wherein L is a stabilizing ligand selected from the group consisting of CO, XRCN and Cl^{-}, X being —H or —OH and R being aliphatic having from one to about four carbon atoms;

separating said slurry into a solid tailings portion and a pregnant liquor, said pregnant liquor containing solubilized ferrous, manganous, cupric and other nonferrous metal ions;

selectively extracting said solubilized metal ions; and

regenerating said cuprous ion solution from said solubilized cupric ions and said ligand, L in the presence of a reductant.

4,545,817
ALLOY USEFUL FOR PRODUCING DUCTILE AND COMPACTED GRAPHITE CAST IRONS

Paul J. Bilek, Danbury, Conn.; Richard A. Flinn, Ann Arbor, Mich.; Thomas K. McCluhan, N. Tonawanda, N.Y., and Paul K. Trojan, Ann Arbor, Mich., assignors to Elkem Metals Company, Pittsburgh, Pa.

Division of Ser. No. 362,866, Mar. 29, 1982, Pat. No. 4,472,197.
This application Apr. 9, 1984, Ser. No. 598,241
Int. Cl.⁴ C22C *37/10*
U.S. Cl. 75—123 E **10 Claims**

1. An iron alloy for treating molten iron containing carbon to produce ductile cast iron containing nodular carbon, or compacted graphite cast iron, said iron alloy comprising by weight from about 0.1 to about 10.0% silicon, about 0.05 to about 2.0% of one or more rare earth elements, about 0.5 to

about 4.0% magnesium, about 0.5 to about 6.5% carbon, the balance of the alloy being iron.

4,545,818

AQUEOUS INK COMPOSITIONS FOR BALL-POINT PENS

Shigeyasu Inoue, Kashihara, and Hiroyoshi Yamamoto, Osaka, both of Japan, assignors to United Kingdom Atomic Energy Authority, England

Filed Oct. 11, 1983, Ser. No. 540,755

Claims priority, application Japan, Oct. 20, 1982, 57-185683; Jan. 28, 1983, 58-13120

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—22 **28 Claims**

1. An aqueous ink composition for ball-point pens which comprises (i) 84.5 to 99.7 parts by weight of an aqueous medium consisting of 40 to 95% by weight of water and 60 to 5% by weight of a hygroscopic wetting agent selected from the group consisting of dihydric alcohols, polyhydric alcohols, pyrrolidone, N-methyl-2-pyrrolidone,dimethylformamide and urea capable of inhibiting the evaporation of water, (ii) 0.1 to 15 parts by weight of a water-soluble or water-dispersible coloring agent and (iii) 0.2 to 0.45 part by weight of xanthan gum in 100 parts by weight of the total composition.

4,545,819

WRITING IMPLEMENT CONTAINING DUAL COLOR INK COMPOSITION

Keiko Shioi, Daito, and Yukito Shoji, Suita, both of Japan, assignors to Sakupa Color Products Corp., Japan

Division of Ser. No. 344,933, Feb. 2, 1982,. This application Jul. 31, 1984, Ser. No. 636,244

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—23 **20 Claims**

1. An implement for writing on an absorbent or porous surface, said implement including a writing or marking tip and said implement containing a writing medium, wherein said writing medium comprises an ink composition including:

a first colorant,

a second colorant and

a vehicle,

said first colorant being dispersed throughout said vehicle and having a particle size sufficiently large so as to substantially not permeate or be absorbed into said writing surface and

said second colorant being a dyestuff dissolved throughout said vehicle and being capable of substantially permeating or being absorbed into said writing surface and diffusing into the area on said surface proximate to said writing,

whereby writing applied by said implement to said surface includes an inner portion of said first colorant bordered by substantial outer portions formed by said second colorant.

4,545,820

SOIL STABILIZER AND METHOD FOR STABILIZING SOIL

William A. Mallow, San Antonio, Tex., assignor to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 404,336, Jul. 30, 1982, abandoned. This application Jul. 13, 1983, Ser. No. 512,761

Int. Cl.[4] C04B *7/35, 35/16*

U.S. Cl. 106—76 **10 Claims**

1. A soil stabilizing composition consisting essentially of 50 to 80 percent by weight of Portland cement, 8 to 25 percent by weight of a hydrated alkali metal silicate powder, and 2 to 10 percent by weight Plaster of Paris.

4,545,821

DISPERSIBLE BERLIN BLUE PIGMENT

Axel Rau, Pfullendorf, and Klaus-Dieter Franz, Kelkheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

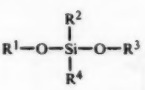
Filed Sep. 21, 1984, Ser. No. 653,126

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334596

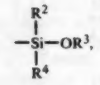
Int. Cl.[4] C04B *31/26*

U.S. Cl. 106—291 **17 Claims**

1. A dispersible Berlin blue pigment comprising mica platelets having a coating of Berlin blue thereon, further comprising a first coating of basic aluminum sulfate, and on the coating of basic aluminum sulfate, a second coating of a mixture of a hydroxide of an alkaline earth metal, aluminum, tin, zinc, iron, cobalt or chromium, and a fatty acid of 4–30 carbon atoms or a polysiloxane of the formula:



where R^1 and R^3 are independently each



H, C_{1-4}-alkyl or poly-(C_{1-4}-alkylene)ether, and R^2 and R^4 are each

C_{1-4}-alkyl or poly(C_{1-4}-alkylene)ether.

4,545,822

PROCESS FOR CLEANING VESSELS CONTAINING SULFUR DICHLORIDE

Mark J. Stodolka, Sanborn, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Apr. 20, 1984, Ser. No. 602,564

Int. Cl.[4] B08B *9/08*

U.S. Cl. 134—10 **8 Claims**

1. A process for cleaning vessels containing liquid sulfur dichloride comprising the steps of:

(a) removing substantially all of the liquid sulfur dichloride from the vessel leaving a solids-containing liquid slurry on the bottom of the vessel.

(b) heating the contents of the vessel in the presence of an inert gas to a temperature sufficient to vaporize the liquid remaining in the vessel leaving a solid residue,

(c) removing the vapor from the vessel by vacuum,

(d) neutralizing the vapor by reaction with sodium hydroxide, and

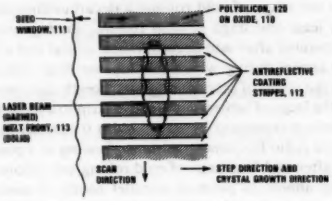
(e) removing the solid residue from the bottom of the vessel.

4,545,823

GRAIN BOUNDARY CONFINEMENT IN SILICON-ON-INSULATOR FILMS

Clifford I. Drowley, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 14, 1983, Ser. No. 551,439
Int. Cl.[4] H01L *21/265;* C30B *19/00*
U.S. Cl. 148—1.5 14 Claims



1. In a method for making single crystal silicon islands, the steps comprising:

forming a first insulating layer over portions of a substrate;

forming a polysilicon layer over said substrate and said first insulating layer;

forming an array of antireflective stripes each having a long axis over said polysilicon layer;

forming a second insulating layer over a region between said antireflective stripes;

forming an inorganic layer over said second insulating layer; and

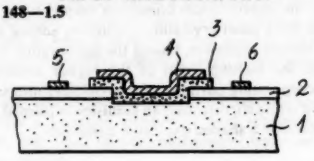
scanning a laser beam perpendicular to said long axis over at least two antireflective stripes simultaneously to form single crystal silicon between said antireflective stripes.

4,545,824

PROCESS FOR PRODUCING A GAAS OR INP SEMICONDUCTOR BY PRE-IMPLANTATION FOLLOWED BY TRANSITION METAL DIFFUSION

Michel Salvi, 90, Chemin de la Pointe Ploumanach, 22700 Perros Guirec; Pierre N. Favennec, Crec3 h Lia, Beg Leguer, Lannion, and Marcel Gauneau, Rue du Hingar Huellau á Brèlévenez, both of 22300 Lannion, all of France

Filed Nov. 24, 1982, Ser. No. 444,429
Claims priority, application France, Nov. 26, 1981, 81 22167
Int. Cl.[4] H01L *21/263, 21/24*
U.S. Cl. 148—1.5 7 Claims



1. A process for producing a semiconductor component comprising the steps of:

providing a semiinsulating substrate belonging to the group including GaAs and InP;

implanting said substrate with ions of an impurity belonging to the group including oxygen, fluorine, chlorine, and bromine; and

thermally diffusing a metal in the thus implanted substrate, said metal belonging to the group including zinc, cadmium and iron.

4,545,825

APEX SEALS FOR HIGH POWER ROTARY PISTON ENGINES

Jun Miyata; Koji Yagii, and Tsutomu Shimizu, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 26, 1984, Ser. No. 593,134
Claims priority, application Japan, Mar. 26, 1983, 58-51080
Int. Cl.[4] C21D *5/00*
U.S. Cl. 148—3 5 Claims

1. An apex seal for rotary piston engines having a body portion and a sliding surface portion which is adapted to be brought into sliding contact with an inner wall surface of a rotor housing of the rotary piston engine, said apex seal comprised of a material containing by weight, 2.5 to 4.0% of C, 1.5 to 3.0% of Si, less than 1.0% of Mn, 0.25 to 2.0% of Ni, 0.25 to 2.0% of Mo, 0.25 to 2.0% of Cu, 0.05 to 0.3% of B, 0.2 to 1.5% of Cr, 0.05 to 1.0% of V and a balance substantially of Fe, said sliding surface portion being of a chilled structure containing in area ratio more than 55% of carbides, said body portion being essentially of bainite structure containing in area ratio less tan 15% of carbides.

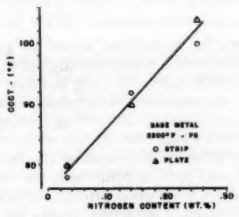
3. A process for manufacturing an apex seal for rotary piston engines having a body portion and a sliding surface portion which is adapted to be brought into sliding contact with an inner wall surface of a rotor housing of the rotary piston engine, said process including the steps of casting a blank of the apex seal comprised of a material containing by weight 2.5 to 4.0% of C, 1.5 to 3.0% of Si, less than 1.0% of Mn, 0.25 to 2.0% of Ni, 0.25 to 2.0% of Mo, 0.25 to 2.0% of Cu, 0.005 to 0.3% of B, 0.2 to 1.5% of Cr, 0.05 to 1.0% of V and balance substantially of Fe; heating the blank in a furnace under a temperature of 900° to 1050° C. for more than 5 hours and cooling the blank in the furnace to produce a body portion, which body portion is essentially of a bainite structure containing in area ratio less than 15% of carbides; and melting and quenching a surface portion of the blank to produce a chilled structure at the surface portion to thereby provide said sliding surface portion, which sliding surface portion has a chilled structure containing in area ratio more than 55% of carbides.

4,545,826

METHOD FOR PRODUCING A WELDABLE AUSTENITIC STAINLESS STEEL IN HEAVY SECTIONS

Thomas H. McCunn, Lower Burrell, and John P. Ziemianski, Avonmore, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1984, Ser. No. 625,928
Int. Cl.[4] C21D *7/02, 7/14*
U.S. Cl. 148—12 E 12 Claims



1. A method for producing an austenitic stainless steel article in heavy sections, said steel comprises, by weight, 20 to 40% nickel, 14 to 21% chromium, 6 to 12% molybdenum, 0.15 to 0.30% nitrogen, and the remainder substantially all iron, the method comprising melting, casting, hot rolling and cold rolling the steel to final gauge greater than 0.065 inch, fully annealing the final gauge steel at temperatures of greater than 1900° F. and less than about 2100° F. to produce a steel substantially free of second phase precipitation.

4,545,827

LOW SILICON STEEL ELECTRICAL LAMINATION STRIP

Prabhat K. Rastogi, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Continuation of Ser. No. 439,770, Nov. 8, 1982, abandoned, which is a division of Ser. No. 279,830, Jul. 2, 1981, Pat. No. 4,394,192. This application Jan. 7, 1985, Ser. No. 689,032

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—31.55 **1 Claim**

1. An electric motor lamination comprising:

a steel composition consisting essentially of, in wt.%:

carbon	.006 max.
manganese	.55–.75
silicon	.15–.25
aluminum	.15–.25
phosphorus	.12 max.
sulfur	.025 max.
iron	essentially the balance;

a decarburized microstructure consisting essentially of ferrite grains and devoid of carbide precipitates, with an average ferritic grain size of about 3.5–5.0 ASTM;

a preponderance of crystallographic planes containing the easiest direction of magnetization;

and a 1.5 T (15 kG) average core loss value less than about 5.70 W/kg (2.60 W/lb.) and average peak permability substantially more than about 2000 G/Oe. for a sample thickness of about 0.018 in. (0.46 mm.).

4,545,828

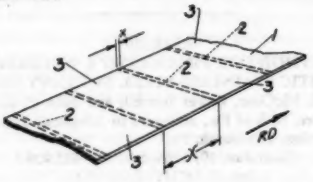
LOCAL ANNEALING TREATMENT FOR CUBE-ON-EDGE GRAIN ORIENTED SILICON STEEL

Jerry W. Schoen, Hamilton, and Russel L. Young, Collinsville, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Nov. 8, 1982, Ser. No. 439,909

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 **4 Claims**



1. A process for controlling secondary grain growth and improving the core loss of cube-on-edge grain oriented electrical steel strip of the type containing less than 6.5% silicon and produced by a routing comprising reduction to hot band thickness, at least two stages of cold rolling, coating with an annealing separator and a high temperature anneal during which the cube-on-edge texture is produced as the result of secondary grain growth, said process comprising the steps of subjecting the steel strip to a local grain growth annealing treatment by either radio frequency induction heating or radio frequency resistance heating at a point in said routing between cold rolling stages to produce parallel bands of annealed regions across the strip with unannealed regions therebetween, said annealed bands containing primary grains at least about 30% larger than those of said unannealed regions, said primary grains of said annealed regions being of such size and said annealed bands having a length in the rolling direction of said strip such that the advance of growing secondary grains in said unannealed regions into said annealed bands is temporarily retarded during the initial portion of said high temperature anneal for secondary grain growth and said enlarged primary grains of said annealed bands are essentially consumed during the final portion of said high temperature anneal for secondary grain growth, whereby said strip, after having been subjected to said high temperature anneal for secondary grain growth, has secondary grains of reduced size and has improved core loss.

2. A process for controlling secondary grain growth and improving the core loss of cube-on-edge grain oriented electrical steel strip of the type containing less than 6.5% silicon and produced by a routing comprising reduction to hot band thickness, at least one stage of cold rolling, a decarburizing anneal after said at least one stage of cold rolling, coating with an annealing separator after said decarburizing anneal and a high temperature anneal during which the cube-on-edge texture is produced as the result of secondary grain growth, said process comprising the steps of subjecting the steel strip to a local grain growth annealing treatment by either radio frequency induction heating or radio frequency resistance heating at a point in said routing after said first stage of cold rolling and before said decarburizing anneal to produce parallel bands of annealed regions across the strip with unannealed regions therebetween, said annealed bands containing primary grains at least about 30% larger than those of said unannealed regions, said primary grains of said annealed regions being of such size and said annealed bands having a length in the rolling direction of said strip such that the advance of growing secondary grains in said unannealed regions into said annealed bands is temporarily retarded during the initial portion of said high temperature anneal for secondary grain growth and said enlarged primary grains of said annealed bands are essentially consumed during the final portion of said high temperature anneal for secondary grain growth, whereby said strip, after having been subjected to said high temperature anneal for secondary grain growth, has secondary grains of reduced size and has improved core loss.

4,545,829

EMULSION SYNTHESIZED COMPOSITE HIGH EXPLOSIVES

John J. Starkenberg, Owings Mills, and Gould Gibbons, Jr., Finksburg, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 13, 1984, Ser. No. 630,800

Int. Cl.[4] D03D *23/00*

U.S. Cl. 149—109.6 **24 Claims**

1. In a process of making composites of high explosives consisting of a crystalline explosive component and an oxidizer component, the improvement consisting essentially of melting the lower melting point crystalline explosive, adding a surfactant to said molten explosive, raising the temperature to within 5° C. above the melting point of the higher melting point oxidizer, incorporating particles of said oxidizer into said molten explosive while stirring until an emulsion is formed, casting said emulsion into a shaped explosive composite.

4,545,830

METHOD OF SEALING PRESSURIZED ELECTRICAL CABLE WHILE UNDER PRESSURE

Zoltan B. Dienes, Annandale, and Thomas L. Mineur, High Bridge, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 17, 1982, Ser. No. 419,256

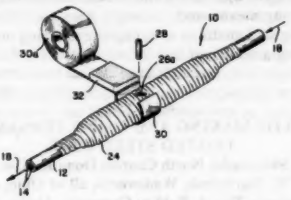
Int. Cl.[4] H01B *13/06*

U.S. Cl. 156—48 **18 Claims**

1. A method of sealing an exposed area of a gas pressurized electrical cable while under pressure, comprising the steps of:

(a) sealably covering, while maintaining a positive gas pres-

sure in said cable, a portion of said exposed area defining thereby a pressure venting area less than that of said ex-



posed area whereby gas may escape therethrough; and then

(b) sealably closing said pressure venting area.

4,545,831

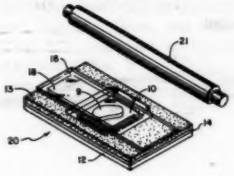
METHOD FOR TRANSFERRING A THIN TISSUE SECTION

Leonard Ornstein, White Plains, N.Y., assignor to The Mount Sinai School of Medicine, New York, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,307

Int. Cl.⁴ G01N *1/00, 33/48;* **A61K** *31/74;* **B44C** *1/16*

U.S. Cl. 156—57 **15 Claims**



1. A process for transferring and mounting a thin section of a tissure specimen supported on a substrate by a first pressure-sensitive adhesive layer from said substrate onto a microscope slide having at least a portion of one surface coated with a second pressure-sensitive adhesive layer, comprising the steps of:

contacting said supported tissue section to said second layer to form a laminate comprising said substrate, said first layer, said tissue section, said second layer, and said microscope slide;

polymerizing said second layer, said second layer being formed of a polymerizable material (1) having acryl or methacryl functional groups, (2) containing no curable components having diffusion coefficients at the temperature of use large enough to permit signficant diffusion into said tissue section prior to or during polymerization and (3) having a viscosity at the temperature of use high enough to prevent significant flow into said tissue section prior to or during polymerization; and

subsequently removing said substrate and said first layer to expose substantially the entire internal structure of said tissue section supported on said microscope slide for subsequent processing.

4,545,832

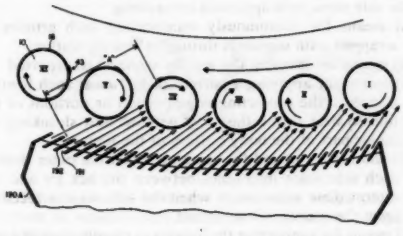
MACHINE AND METHOD FOR APPLYING HEAT SHRINK LABELS

Wolfgang Hoffmann, Modesto, Calif., assignor to B & H Manufacturing Company, Inc., Ceres, Calif.

Continuation-in-part of Ser. No. 382,374, May 27, 1982, , Ser. No. 438,386, Nov. 1, 1982, Pat. No. 4,406,721, and Ser. No. 471,655, Mar. 3, 1983, Pat. No. 4,416,714. This application Aug. 1, 1983, Ser. No. 519,267

Int. Cl.⁴ B29C *27/00*

U.S. Cl. 156—86 **3 Claims**



1. A method of applying heat shrinkable film to articles each of said articles having a vertical body and an inwardly sloping end portion at at least one end of the body, such method comprising:

(a) cutting segments of such film from a continuously moving length of film, each segment having a leading end and a trailing end

(b) continuously transporting each severed segment to an applicator station

(c) continuously transporting such articles to said applicator station

(d) continuously applying the leading end of each segment at such applicator station to the body of an article, wrapping it tightly around the article with the trailing end of the segment overlapping the leading end and forming a side seam which is held together by means of an adhesive and in so doing allowing one edge or both edges of the applied segment to project beyond the body portion and overlie, but to be spaced from, the adjacent inwardly sloping portion or portions of the article

(e) said side seam being a laminar structure comprising an outer strip formed by the trailing end of the segment, an inner strip formed by the leading end of the segment and an intermediate strip formed by said adhesive, said intermediate strip presenting an exposed area at the outer extremity of said trailing end, said exposed area being susceptible to melting when a current of hot air impinges directly upon it thereby resulting in damage to the side seam

(f) continuing the transport of such articles so wrapped with segments of heat shrinkable film (and meanwhile spinning the articles) through a heating station

(g) blowing hot air onto the projecting edge or edges of the articles during transport through the heating station to shrink such edge or edges onto the article and

(h) minimizing damage to said side seams by (1) spinning said articles in a direction in relation to the transport of said articles in step (f), so that the outer strip of each side seam intervenes between the hot air and the intermediate strip except while the side seam is receding from the source of hot air, and (2) packing the articles sufficiently closely together and maintaining the direction of rotation and the direction of transport of said articles such that when the intermediate strip of each article is not shielded by said outer strip, it is shielded by a preceding article.

3. Apparatus for heat shrinking heat shrinkable film onto articles each of which has a vertical body and at least one end portion sloping inwardly from the body, each such article being tightly wrapped with a heat shrinkable but unshrunken

film said film having a leading end and a trailing end, said leading end overlapping said trailing end to form a side seam which is held together by means of adhesive, said film projecting beyond the body portion at at least one edge and lying opposite but unattached to such sloping portion or portions, said side seam being a laminar structure comprising an outer strip formed by the trailing end of the segment, an inner strip formed by the leading end of the segment and an intermediate strip formed by said adhesive, said intermediate strip presenting an exposed area at the outer extremity of said trailing end, said exposed area being susceptible to melting when a current of hot air impinges directly upon it thereby resulting in damage to the side seam, said apparatus comprising

(a) means for continuously transporting such articles so wrapped with segments through a heating station

(b) means for spinning the articles while so transported

(c) means for applying a current of hot air at such heating station to the projecting edge portion or portions of the film to heat shrink the same without heat shrinking the major part of the body portion of the film

(d) said means (a) and (b) being such that the outer strip of each side seam intervenes between the hot air and the intermediate strip except when the side seam is receding from the source of hot air and

(e) means for supporting the articles in closely packed array during transport such that during transport and spinning of the articles, the exposed area of each side seam is shielded by a preceding article when not shielded by the outer cover strip.

4,545,833

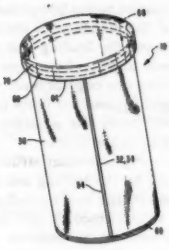
METHOD OF MAKING A FILTER BAG ASSEMBLY

Peter T. Tafara, 4803 Spring St., Neptune, N.J. 07753

Filed Mar. 8, 1984, Ser. No. 587,454

Int. Cl.[4] B32B *31/16, 7/08*

U.S. Cl. 156—93 **10 Claims**



1. A method for fabricating a filter bag comprising the steps of:

(a) preparing filter media in an elongated, generally rectangular configuration;

(b) folding said media in half along its longitudinal axis;

(c) placing the juxtaposed edges of said media over a resistance wire disposed in a heater bar;

(d) closing said pressure bar upon said heater bar with said media disposed therebetween with a prescribed amount of pressure;

(e) applying electrical current to said resistance wire for a prescribed period of time;

(f) opening said pressure bar after termination of said electrical current and a prescribed low temperature limit is reached;

(g) removing said media from said heater bar;

(h) inserting one distal end of said media between said pressure bar and said heater bar with a prescribed amount of pressure;

(i) applying electrical current to said resistance wire for a prescribed period of time;

(j) opening said pressure bar after termination of said electrical current and said prescribed low temperature limit is reached;

(k) placing the open distal end of said media over a relatively rigid ring means; and

(l) sewing said media so as to capture said ring means thereto forming a container.

4,545,834

METHOD OF MAKING AND USING TERNARY ALLOY COATED STEEL WIRE

Robert M. Shemenski, North Canton; Dong K. Kim, Akron, and Thomas W. Starinshak, Wadsworth, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 530,281, Sep. 8, 1983, Pat. No. 4,446,198. This application Apr. 27, 1984, Ser. No. 604,550

Int. Cl.[4] B29H *17/00;* **C25D** *5/10, 5/50*

U.S. Cl. 156—124 **20 Claims**

1. An improved process for manufacturing a rubber article that contains at least one steel reinforcing element which comprises:

(1) coating the steel reinforcing element with a ternary iron-brass alloy consisting essentially of from about 55 percent to about 75 percent by weight copper, from about 0.1 percent to about 10 percent by weight iron, and about 15 percent to about 45 percent by weight zinc;

(2) surrounding the metal reinforcement with a rubber to conform to the desired shape of the rubber article being produced, and

(3) curing the rubber article.

4,545,835

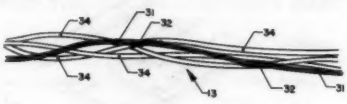
METHOD OF FORMING SUPPORTED ANTISTATIC YARN

James A. Gusack, and Thomas E. Smith, both of Williamsburg, Va., assignors to Badische Corporation, Williamsburg, Va.

Filed Jun. 15, 1983, Ser. No. 504,359

Int. Cl.[4] D02G *3/04*

U.S. Cl. 156—180 **7 Claims**



1. A continuous method of making a supported antistatic yarn, the method comprising the steps of:

(a) suffusing finely divided, electrically conductive particles into a polymeric filamentary substrate by applying a dispersion of particles in a liquid, the liquid being a solvent for the substrate; and

(b) contacting the filamentary substrate with a support yarn before the solvent applied to the filamentary substrate has evaported, the solvent being a solvent for both the filamentary substrate and the support yarn; and

(c) evaporating the solvent so that the filamentary substrate is intermittently solvent-bonded to the support yarn.

4,545,836

METHOD OF MAKING A SET OF MARIMBA MALLETS

Daniel K. Lidster, 2010 Medford #D-33, Ann Arbor, Mich. 48104

Filed Nov. 8, 1982, Ser. No. 440,169

Int. Cl.[4] G10D *13/06;* **B65H** *81/00*

U.S. Cl. 156—185 **5 Claims**

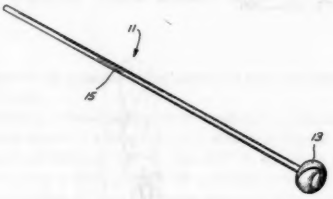
1. A method of making a set of xylophone/marimba mallets comprising a plurality of mallets each having a different visual color of mallet head of approximately the same size and each said mallet having a different timbre producing characteristic including the steps of:

measuring a determined amount of liquid rubber for each mallet;

measuring a determined amount of different pigment materials, associating each pigment material with an individual mallet;

mixing each pigment material and the measured rubber for each associated mallet, until the respective pigment material is thoroughly dispersed in its respective mixture;

forming each of the liquid mixtures into at least one solid layer strip;



securing a mass to each end of each of a plurality of mallet sticks;

wrapping at least one strip of a respective pigment mixture around the respective mass of the associated mallet, for each mallet, to form the mallet heads, said step of wrapping including wrapping the mass of an associated mallet with a determined number of wraps and with the tightness of wraps determined in association with the particular color of the pigment material of the layer strip

wherein the different timbre is achieved by wrapping strip of the same rubber at different stretch intensity.

4,545,837

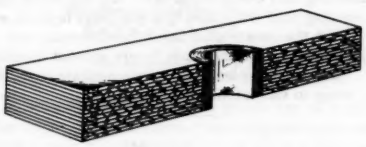
MOLDED-IN COMPOSITE BUSHINGS

George J. Wehnert, Madison, Conn., and Stanley J. Richter, Long Island City, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 499,699, May 31, 1983,. This application Jan. 18, 1985, Ser. No. 692,455

Int. Cl.⁴ B32B *31/14*

U.S. Cl. 156—191 **2 Claims**



1. A method of making a fiber reinforced resin matrix composite article having a fiber reinforced resin matrix bushing comprising:

preparing an uncured, resin impregnated fiber reinforced composite article having at least one connecting hole formed therein,

tightly wrapping uncured resin impregnated fibers around a central axis forming a plug, until the diameter of the plug is substantially the same as that of the formed hole in the uncured composite article,

the plug is then inserted into the formed hole of the composite such that the central axis around which the plug is wrapped is substantially perpendicular to the composite article fiber orientation,

the composite article containing the plug is then cured, and an attachment hole of the proper dimensions is then drilled into the plug forming the bushing, said bushing having at least one layer of fibers which are oriented about ±20° to about ±60° to the central axis of the bushing.

4,545,838

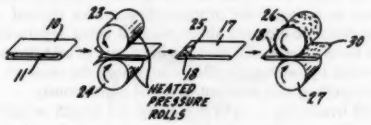
LAMINATION PRODUCT AND METHOD EMPLOYING TEMPORARY TRANSFER FILM

Morton Minkus, and Herbert M. Drower, both of Wilmette, Ill., assignors to Sealtran Corp., Chicago, Ill.

Filed Feb. 7, 1983, Ser. No. 464,680

Int. Cl.⁴ B32B *31/00*

U.S. Cl. 156—220 **11 Claims**



1. The method of forming a transparent sealed protective cover on an identification card or other document comprising the following steps:

A. applying a thin coating of a release agent to one surface of a transfer film of a very hard, tough thermoset resin;

B. extruding a layer of a moderately hard and tough embossable unoriented thermoplastic polyester resin onto the coated surface of the transfer film, over the release coating, to form a laminating film product having a cover film of the thermoplastic polyester resin releasably bonded in surface-to-surface relation to the transfer film;

C. aligning the laminating product with a document, with the cover film facing the document;

D. applying heat and pressure to the aligned laminating product and document, in a laminating press, to bond the laminating product to the document; and

E. peeling the transfer film away from the laminating product to expose the cover film.

4,545,839

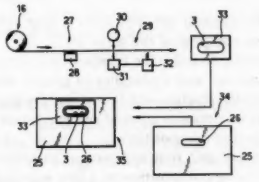
DUST-PROOF REINFORCING SHEET MATERIAL TO BE APPLIED OVER HANDLING OPENING FORMED ON WALL OF BOX

Yasuyuki Nakagawa, Hirakata, Japan, assignor to Asahi Kakoshi Co., Ltd., Osaka, Japan

Division of Ser. No. 536,936, Sep. 28, 1983,. This application Oct. 23, 1984, Ser. No. 663,885

Int. Cl.⁴ B32B *31/10, 31/12, 31/30*

U.S. Cl. 156—244.11 **8 Claims**



1. A process for the preparation of a dust-proof reinforcing sheet material to be applied over and around an opening provided through a wall of a box for handling the box, the process comprising the steps of:

(a) drawing a base sheet applied with an adhesive layer on one side thereof from a reel followed by punching out through-holes successively to form a row of through-holes equi-distant apart along the entire length of said base sheet;

(b) applying an elastic film over the other side of said base

sheet, said elastic film being stretchable to have an area of five times or more of the original surface area thereof and being transparent or translucent to allow light rays to transmit therethrough so that the position of the sheet material is sensed by photo-sensor means; and

(c) taking up the finished sheet material around a take-up reel.

5. A process for applying a dust-proof reinforcing sheet material over and around an opening provided through a wall of a box for handling purpose, said dust-proof reinforcing sheet material having a through-hole substantially co-extensive with said opening provided through the wall of the box and covered by an elastic film which is stretchable to have an area of five times or more of the original surface area thereof, and said dust-proof reinforcing sheet material being separated one by one from a composite web having a row of said through-holes covered by said elastic film, comprising the steps of:

(a) pulling said web out of a reel continuously;

(b) irradiating a light ray along the length of said web to allow the light ray to transmit through said elastic film to a photo-sensor thereby to sense the position of the moving web to cut the same at a precise position; and

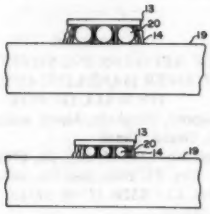
(c) applying the thus separated sheet material over and around said opening in position where said through-hole of said dust-proof reinforcing sheet material is put coextensive with said opening provided through the wall of the box.

4,545,840

PROCESS FOR CONTROLLING THICKNESS OF DIE ATTACH ADHESIVE

Robert Newman, San Jose, and Fred Johnson, Sunnyvale, both of Calif., assignors to Monolithic Memories, Inc., Santa Clara, Calif.

Filed Mar. 8, 1983, Ser. No. 473,310
Int. Cl.[4] B32B *31/00*
U.S. Cl. 156—276 **11 Claims**



1. The method for attaching a first structure to a second structure comprising the steps of:

providing an adhesive composition comprising an adhesive, a solvent, and a plurality of spacer means;

physically placing said first structure and said second structure on opposite sides of and in contact with a layer of said adhesive composition;

subjecting said first and second structures and said layer of adhesive composition to a first selected temperature sufficient to cause the evaporation of said solvent from said layer of adhesive composition and greater than or equal to the melting point of said spacer means, thereby causing said spacer means to decrease in thickness,

subjecting said first and said second structures and said layer of adhesive composition to a second selected temperature greater than said first selected temperature, said second selected temperature being sufficient to cause said layer of adhesive composition to melt; and

cooling said first and second structures and said layer of adhesive composition to a temperature beneath said second selected temperature, thereby causing said layer of adhesive to solidify, thereby permanently attaching said first structure to said second structure.

4,545,841

METHOD FOR FABRICATING A GLOVE WITH AN INTERMEDIATE MEMBRANE LAYER

Donald Jackrel, c/o 1700 Broadway, New York, N.Y. 10019

Division of Ser. No. 526,472, Aug. 25, 1983, Pat. No. 4,520,056, which is a division of Ser. No. 418,574, Sep. 15, 1982, Pat. No. 4,430,759. This application Feb. 26, 1985, Ser. No. 705,785
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—290 **4 Claims**

1. A method for fabricating an article of clothing of the type adapted to surround a portion of the body of the wearer, comprising the steps of:

forming an inner layer in the general given shape and size of the body portion;

forming an outer layer having substantially said given shape and being slightly larger than said given size;

forming an intermediate layer of gas permeable, liquid impermeable material, said intermediate layer being substantially said given shape and being of a size necessary to fit between said inner and outer layers;

inserting said intermediate layer into the outer layer;

inserting said inner layer into the outer layer so as to sandwich the intermediate layer therebetween; and

joining the inner and outer layers without interrupting the integrity of the body of the intermediate layer, or bonding same to said intermediate layer.

4,545,842

METHOD FOR ADHESIVE BONDING OF ALUMINUM

Robert C. Parsons, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jul. 27, 1984, Ser. No. 635,158
Int. Cl.[4] B32B *7/00*; C09J *5/04*
U.S. Cl. 156—310 **4 Claims**

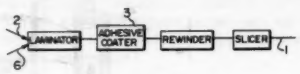
1. In a method for bonding a plastics resin film to aluminum comprising applying an adhesive to said film or said aluminum, drying said adhesive, contacting said film and said aluminum with said adhesive therebetween to form a laminate and subjecting said laminate to heat and pressure to bond said laminate the improvement comprising treating the surface of said aluminum to be bonded with a composition consisting essentially of an aqueous solution having from about 0.5 to about 10 grams per liter of polyacrylic acid or esters thereof and from about 0.2 to about 8 grams per liter of at least one acid selected from the group consisting of H_2ZrF_6, H_2TiF_6 and Hp_2SiF_6 and drying said composition on said aluminum prior to contacting said film and said aluminum with said adhesive therebetween.

4,545,843

METHOD OF MANUFACTURING ADHESIVE TAPE

David Bray, 2198 Corsair Rd., Mississauga, Ontario, Canada (L5A 2L8)

Filed Aug. 15, 1983, Ser. No. 523,020
Claims priority, application Canada, Sep. 1, 1982, 410552
Int. Cl.[4] B32B 7/00
U.S. Cl. 156—322 22 Claims



1. A method of manufacturing adhesive tape including the following steps:

(a) laminating at least one layer of a substrate material to at least one layer of a heat activated adhesive film at a temperature of between 200° F. and 500° F. to obtain a laminate having a first surface of substrate material and a second surface of heat activated adhesive film; and

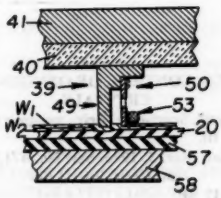
(b) coating said second surface of said laminate with a pressure sensitive adhesive to obtain an adhesive tape, wherein said heat activated adhesive film comprises a random co-polymer of ethylene and acrylic acid.

4,545,844

HEAT CUTTING AND SEALING APPARATUS

Bradley H. Buchanan, One Sola Ave., San Francisco, Calif. 94116

Continuation of Ser. No. 256,963, Apr. 23, 1981, abandoned. This application Nov. 21, 1984, Ser. No. 673,821
Int. Cl.[4] B32B 31/18
U.S. Cl. 156—515 21 Claims



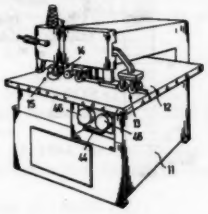
1. In an apparatus for forming an article out of a pair of superimposed heat-sealable panels comprising conveyor means for moving a pair of superimposed webs along a path and a cutting and sealing station for receiving said webs including unitary cutting and sealing die means for simultaneously cutting said webs at a predetermined cutting temperature to define said panels and heat sealing said panels together at a predetermined sealing temperature that is substantially lower than said cutting temperature to form said article, said die means including a vertically disposed heat conductive sealing die, a vertically disposed heat conductive cutting die having an upper end portion thereof directly secured solely to said sealing die in heat conducting relationship therewith, heating means directly secured only to a lower end portion of said cutting die for heating it to said predetermined cutting temperature and control means formed in said cutting die between the upper and lower end portions thereof for impeding and simultaneously controlling the conduction of heat composing said cutting temperature from said heating means, upwardly through said cutting die and to said sealing die to create said sealing temperature.

4,545,845

MACHINE FOR ASSEMBLING VENEER STRIPS

Heinz Biewald, Zum Galgenkamp 72, 4840 Rheda-Wiedenbrück; Theo Grönebaum, Eschenweg 24a, and Hans-Heinrich Kuper, Oesternforth 28, both of 4835 Rietberg, all of Fed. Rep. of Germany

Filed Feb. 7, 1984, Ser. No. 577,716
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304315; Jul. 12, 1983, 3325050
Int. Cl.[4] B32B 31/12
U.S. Cl. 156—544 7 Claims



1. A machine for assembling veneer strips as they pass along a machine table in a conveying direction, said machine comprising a machine frame, conveying means mounted in the machine frame for gathering together veneer strips by their butt edges, said machine also comprising a feed device for supplying adhesive filament, said feed device applying an adhesive filament to the upper surface of gathered veneer strips in an undulatory or zigzag manner over the butt edge region, a glue spreading device which coats the lateral longitudinal butt edges of said veneer strips with glue, said spreading device being disposed on said machine frame in front of said filament feed device when viewed in the conveying direction of the veneer strips, and at least one hot air nozzle disposed behind said spreading device in front of said filament feed device, said glue spreading device including a lowerable tool carrier disposed on said machine frame beneath the machine table and being horizontally displaceable from an operating position in the region of said machine table at right angles to the conveying direction of the veneer strips, a pressure medium cylinder vertically retained on said machine frame, a rod extending vertically from said cylinder for selective extension and retraction relative thereto, said rod having a free upper end with a support element thereon, said tool carrier, in the operating position, being supported on the support element, two link parallelograms on said frame, each comprising a lower link rod and an upper link rod, said link parallelograms pivotally connecting said tool carrier to two slidably mounted horizontal connecting rods disposed at right angles to the conveying direction of the veneer strips.

4,545,846

ENVELOPE GUMBOX FRICTION BRAKE AND SAFETY SLIP CLUTCH

Harold R. Lillibridge, Burlingame, and Joseph D. Russo, Palo Alto, both of Calif., assignors to Champion International Corporation, Stamford, Conn.

Filed Aug. 27, 1984, Ser. No. 644,369
Int. Cl.[4] B32B 1/00
U.S. Cl. 156—578 8 Claims

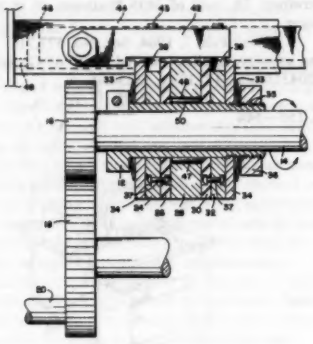
1. In an apparatus for applying sealant material to an envelope, said sealant material being disposed in a gumbox, the improvement comprising:

means for raising and lowering said gumbox to a position wherein the sealant material disposed within said gumbox can be disposed on a gum transfer roller, said means including

a rotatable shaft,

drive means on one end of said shaft for rotating said shaft,

means between said shaft and gumbox for raising and lowering said gumbox in response to rotation of said shaft, said means including



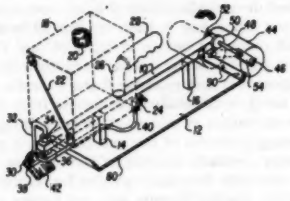
a friction brake for preventing substantial rotation of said shaft in response to cessation of said drive means for rotating said shaft.

4,545,847

ROOFING EDGE SEAMING APPARATUS

Robert F. Schneller, P.O. Box 335, Loveland, Colo. 80723

Filed May 24, 1983, Ser. No. 497,499
Int. Cl.[4] B32B *31/20*
U.S. Cl. 156—579 **4 Claims**



1. A portable, hand-held roofing edge seaming apparatus comprising:

a generally flat, rectangular skid plate having parallel sides and upwardly turned front and rear ends;

frame means connected to said skid plate, said frame means being centrally, longitudinally positioned above said skid plate;

handle means connected to said frame means for enabling the user to urge the apparatus along a roofing seam;

a reservoir connected to said frame means for holding a quantity of a generally liquid roofing solvent;

brush applicator means swivelably connected to said frame means forward of said front end of said skid plate and generally centrally positioned between said parallel sides thereof, said brush applicator means being positionable, during operation of said apparatus, between two overlapping roofing members to be seamed and being adapted to receive a flow of solvent from said reservoir so as to apply solvent between the two overlapping roofing members to be seamed as said apparatus is urged therealong; and

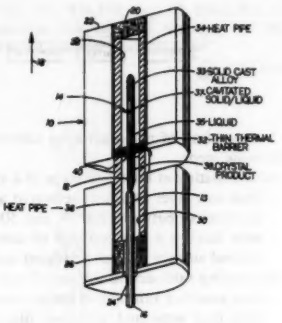
weighted roller means connected to said frame means so as to trail rearward of the rear end of said skid plate to apply pressure over a roofing seam to which solvent has been applied by said brush applicator means as said apparatus is urged therealong.

4,545,848

HCT CRYSTAL GROWTH METHOD

Sandor L. Lehoczky, and Frank R. Szofran, both of Huntsville, Ala., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 8, 1982, Ser. No. 439,800
Int. Cl.[4] C30B *21/02*
U.S. Cl. 156—616 R **20 Claims**



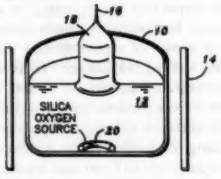
1. In a method of growing pseudobinary crystals and the like by a modified Bridgman-Stockbarger technique, the improvement comprising, maintaining the temperature of an upper zone in a crystal growth furnace at a temperature effective to create a cavitated solid/liquid in the portion of an alloy composition placed in the upper zone and directionally solidifying the liquid from the cavitated solid/liquid in the lower zone of the furnace while translating the alloy relatively through the furnace in the direction of from the upper zone to the lower zone and controlling the temperatures of the upper and lower zones at levels effective to produce multi-directional homogeneity in the alloy crystals.

4,545,849

METHOD FOR CONTROL OF OXYGEN IN SILICON CRYSTALS

F. Secco d'Aragona, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Mar. 3, 1983, Ser. No. 471,585
Int. Cl.[4] C30B *15/00*
U.S. Cl. 156—617 SP **3 Claims**



1. An improved process for pulling a silicon crystal having an elongate axis from a melt contained in a silica crucible to achieve a crystal substantially uniformly doped along said axis with oxygen at a concentration greater than about 1.6×10^{18} cm^{-3}, wherein the improvement comprises: attaching to the bottom of the interior of said crucible, substantially coaxial with said axis , a toroidal shaped piece of silica; and rotating said crystal during growth to drive oxygen from said toroidal shaped piece of silica to said crystal.

4,545,850
REGENERATIVE COPPER ETCHING PROCESS AND SOLUTION

Norvell J. Nelson, Palo Alto, Calif., assignor to Psi Star, Hayward, Calif.

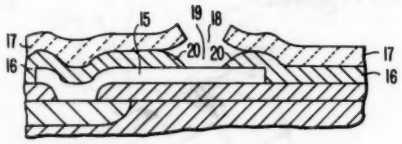
Filed Aug. 20, 1984, Ser. No. 642,150
Int. Cl.[4] C23F *1/00*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—642 4 Claims

1. In a regenerative process for etching copper, the steps of: contacting the copper with an aqueous solution of nitric acid to dissolve the copper and form copper nitrate, and adding sulfuric acid to the solution to convert the copper nitrate to nitric acid and a copper precipitate.

4,545,851
ETCHING METHOD FOR SEMICONDUCTOR DEVICES

Tadakazu Takada, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 1, 1984, Ser. No. 605,908
Claims priority, application Japan, May 9, 1983, 58-80503
Int. Cl.[4] H01L *21/306*; B44C *1/22*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—643 10 Claims

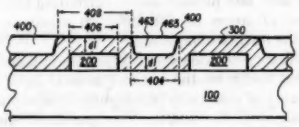


1. An etching method for fabricating a semiconductor device having first and second surfaces on opposite sides, said method comprising the steps of:
(a) forming a layer to be etched on the first surface of the device;
(b) forming a photo resist mask having a predetermined pattern on the layer and leaving a portion of the layer exposed;
(c) heating the second surface of the device to a first temperature; and
(d) supplying an active etchant gas at a second temperature lower than the first temperature and etching the portion of the layer exposed.

4,545,852
PLANARIZATION OF DIELECTRIC FILMS ON INTEGRATED CIRCUITS

Donald L. Barton, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 20, 1984, Ser. No. 622,439
Int. Cl.[4] B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*
U.S. Cl. 156—643 9 Claims

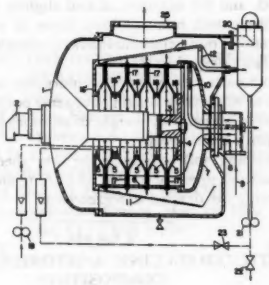


1. A method for producing a semiconductor structure over a substrate having a pattern thereon, said pattern comprising mesa-like portions having a trench region therebetween, the steps comprising:
forming a first layer over the mesa-like portions and trench region, the first layer over the mesa-like portions having a first thickness;
forming a second layer over said first layer, said second layer over the trench region having a second thickness, the second thickness being approximately equal to or greater than the height of the mesa-like portions;
forming a polymer layer over the second layer;
etching the polymer layer to expose the second layer over the mesa-like portions and leaving a portion of the polymer layer over the trench region; and
etching the second layer to expose the first layer over the mesa-like portions and leaving a portion of the second layer over the first layer in the trench region so that the exposed first layer over the mesa-like portions and the portion of the second layer over the first layer in the trench region creates a substantially planar surface.

4,545,853
FILM EVAPORATORS

Vaclav Feres, Haid- und Neu-Strasse 14, D-7500 Karlsruhe 1, Fed. Rep. of Germany

Filed Jan. 24, 1984, Ser. No. 573,354
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332679
Int. Cl.[4] B01D *1/22*
U.S. Cl. 159—7 14 Claims



1. A film evaporator comprising a support, a shaft supported in said support for rotation on an axis of said shaft, a plurality of frustoconical surface elements fixed in axially spaced relationship on said shaft, each said frustoconical surface element forming a closed tapered surface around said shaft axis and being arranged in opposed paired relationship with an adjacent such frustoconical surface element, each such paired set of frustoconical surface elements being provided in spaced relationship from each other along said shaft, said frustoconical surface element sets cooperating with each other to define a convex outer side and a complementary concave inner radial side, said frustoconical surface elements as so arranged defining an inner evaporation space, cylinder means cooperating with said outer sides of frustoconical surface elements and defining an annular heat vehicle space outside of said evaporation space, means for running a product feed to said inner sides of said frustoconical surface elements so that the product may be spread out in the form of a film, means for introducing a heated vehicle to said annular space such that said heat vehicle is collected on the inside of said cylinder means, means for removing heat vehicle condensate, circumaxially spaced radial tubelets fixed to said frustoconical surface elements at radially inner bases of said tubelets, said tubelets having small inside diameters and running through said annular heat vehicle space, the sum of the circumferences of said tubelets at said bases thereof on one such frustoconical surface element set being materially equal to the circumferential length of the outer limit of said frustoconical surface element set on which said tubelets are fixed.

4,545,854

METHOD FOR PREPARING A FIBROUS PRODUCT CONTAINING CELLULOSIC FIBERS AND USEFUL IN PARTICULAR, IN THE FIELD OF COVERINGS IN LIEU OF ASBESTOS

Daniel Gomez, and Giampaolo Bartoli, both of Charavines, France, assignors to Arjomari-Prioux, Paris, France

Continuation of Ser. No. 260,181, May 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 963,015, Nov. 22, 1978, Pat. No. 4,269,657. This application Nov. 28, 1983, Ser. No. 555,835

Claims priority, application France, Nov. 23, 1977, 77 35245

The portion of the term of this patent subsequent to May 26, 1999, has been disclaimed.

Int. Cl.⁴ D21H *1/10*

U.S. Cl. 162—135 **22 Claims**

1. A method of preparation of a fibrous cellulosic fibers-containing product having good dimensional and thermal stability, elasticity and resistance to traction and tearing which comprises the steps of

(a) producing a flow of an aqueous suspension through a machine of the paper-making type, the aqueous suspension comprising:

100 parts by weight of fibers selected from the group consisting of (i) slightly refined cellulosic fibers having a Schopper-Riegler degree comprised between 5 and 35, and (ii) mixtures of said slightly refined cellulosic fibers with non-cellulosic fibers in which the weight ratio of non-cellulosic fibers to cellulosic fibers in lower than or equal to 0.1,

1 to 5 parts by weight of an inorganic flocculating agent, 5 to 30 parts by weight of organic polymeric binder, and 30 to 60 parts by weight of an inorganic filler,

to form a wet sheet,

(b) draining and squeezing the wet sheet under a linear squeezing pressure of 5 to 35 kg/cm, and

(c) drying the drained squeezed sheet.

4,545,855

SUBSTITUTED SUCCINIC ANHYDRIDE/EMULSIFIER COMPOSITION

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 31, 1983, Ser. No. 480,633

Int. Cl.⁴ D21H *3/08*

U.S. Cl. 162—158 **14 Claims**

1. A stable hydrocarbyl-substituted succinic anhydride/non-ionic emulsifier composition comprising:

(A) 70 to 99.5% of a normally liquid hydrocarbyl-substituted succinic anhydride containing from 6 to 50 carbon atoms in the substituent; and

(B) 0.5 to 30% of a polyethylene glycol diester emulsifier derived from a polyethylene glycol containing from 21 to 150 ethylene oxide units and a monocarboxylic acid containing from 8 to 25 carbon atoms.

4,545,856

STABLE SUBSTITUTED SUCCINIC ANHYDRIDE/ETHER-ESTER EMULSIFIER COMPOSITION AND METHODS FOR ITS USE

William A. Sweeney, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 28, 1984, Ser. No. 584,380

Int. Cl.⁴ D21H *3/08*

U.S. Cl. 162—158 **16 Claims**

1. A stable hydrocarbyl-substituted succinic anhydride/emulsifier composition comprising:

(A) 70 to 99.5% of a normally liquid hydrocarbyl-substituted succinic anhydride containing from 6 to 50 carbon atoms in the substituent; and

(B) 0.5 to 30% of an emulsifier of the formula:

$$R—W—Y_n$$

wherein

R is a hydrophobic alkyl, alkylaryl, or arylalkyl group containing from 1 to 30 carbon atoms;

W is a water-soluble polyethyleneoxy-containing group having from 4 to 150 ethylene oxide units which is independently connected to R and Y through oxygen, sulfur or nitrogen linkages;

Y is an acyl capping group for the oxygen, sulfur or nitrogen linkages on W not connected to R, wherein Y contains from 10 to 40 carbon atoms;

n is ½, 1, 2, or 3;

and the hydrophile-lipophile balance is between about 9 and 18 on the HLB scale.

4,545,857

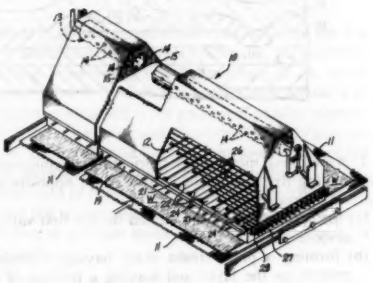
LOUVERED STEAM BOX FOR CONTROLLING MOISTURE PROFILE OF A FIBROUS WEB

Roger Wells, Mercer Island, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 16, 1984, Ser. No. 571,321

Int. Cl.⁴ D21F *1/80, 5/00;* F26B *13/02, 21/12*

U.S. Cl. 162—252 **11 Claims**



1. A steam hood for use adjacent to a moving moist fibrous web to control the moisture profile across the width of the web which comprises:

a. a steam plenum means of sufficient length to extend across the web;

b. a steam inlet means for the plenum means, said inlet means being adapted to supply substantially nonturbulent steam at essentially atmospheric pressure within the plenum means;

c. a steam outlet control means at the outlet of the plenum means so as to be positionable adjacent to the web at the outlet of the steam hood, said control means structured to deliver varying amounts of steam from the plenum means to the web at different positions across the full width of the web, said plenum means permitting free lateral movement of steam to said different positions, said control means further comprising

a plurality of side-by-side adjoining compartments across the width of the control means, each compartment being of essentially rectangular cross section defined by side and end walls, each compartment being in communication with the plenum means;

a damper means located in each compartment, said damper means comprising at least one damper blade affixed to a shaft journaled in the compartment walls and a position control lever affixed to the shaft so that the damper blade is rotatable between a closed and an open position to act as a steam outlet valve for the compartment; and

operating rod means associated with each position control lever in order to individually control the position of each damper blade, each operating rod means extending

to an operating location on the steam hood wherein each damper means can be individually positioned to deliver an amount of steam to an adjacent portion of the web so as to achieve a more uniform moisture profile across the web.

4,545,858

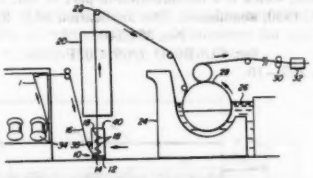
PULP INSULATED TELECOMMUNICATIONS CONDUCTOR

John F. Porter, St. Catharines; Joerg-Heim J. Walling, Beaconsfield, and Oleg Axiuk, Pincourt, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 424,086, Sep. 27, 1982, Pat. No. 4,441,961. This application Mar. 19, 1984, Ser. No. 590,956

Int. Cl.⁴ D21H *1/00*

U.S. Cl. 162—267 **12 Claims**



1. Apparatus for applying pulp insulation to a conductor comprising:

an acrylic resin solution bath;

a first roll rotatable within the solution bath;

and then, in order from the first bath and downstream along the feedpath:

a series of wiping rolls extending in staggered relationship in two rows along sides of the feedpath with peripheral regions of the rolls of one row extending between the rolls of the other row across the feedpath;

a solution drying oven;

a pulp bath;

a pulp drying oven;

means for drawing the conductor at controlled speed along a feedpath beneath the first roll, through the series of wiping rolls, the solution drying oven, the pulp bath and the pulp drying oven; and

drive means drivably connected to each wiping roll and control means for the drive means to set and control a difference between the speed of operation of the drawing means and the peripheral surfaces of the rolls.

4,545,859

METHOD FOR PRODUCING NEEDLE COKE

Arnold E. Kelley, Orange; Michael J. Block, and Milan R. Skripek, both of Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

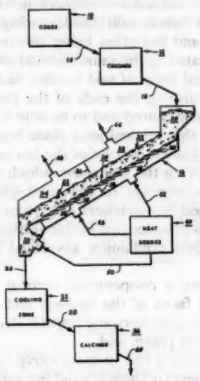
Filed Apr. 27, 1983, Ser. No. 489,217

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.⁴ C10B *49/06*

U.S. Cl. 201—17 **31 Claims**

1. A method for producing calcined needle coke from green needle coke made in a coking zone, said green needle coke having a Hardgrove Grindability Index above about 90, which method comprises: (a) heating said green needle coke at temperatures between about 935° F. and about 1100° F. for a time between about 10 minutes and about 24 hours, said time being sufficient to effect a reduction in the friability of said green needle coke as determined by a decrease in said Hardgrove Grindability Index, (b) cooling the heated green needle coke



below about 250° F., and (c) calcining the cooled green needle coke at calcination temperatures above about 2000° F.

4,545,860

BATTERY OF COKE OVENS AND A METHOD FOR REPAIRING THEM

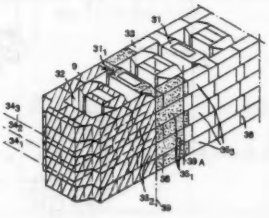
Edmond Lyskawa, Douai; Paul Roger, Dunkerque; Jean Marquis, Lens, and Etienne Canivez, Douai, all of France, assignors to Entreprise Lyskawa S.A.; Union Siderurgique du Nord et de L'est da la France (USINOR) S.A. and Etudes Techniques et Realisations (CdF Ingenierie) S.A., all of, France

Filed Mar. 10, 1983, Ser. No. 474,012

Claims priority, application France, Mar. 10, 1982, 82 04033

Int. Cl.⁴ C10B *29/06*

U.S. Cl. 201—41 **10 Claims**



1. In a method of repairing a battery of coke ovens having a structure of bricks that provides in the longitudinal direction of the battery an alternate succession of oven cells for holding coal to be distilled and of piers to be supplied with air and gas so that the heat from the combustion of the gas cokes the coal in the cells, the cells being provided at their upper ends with inlets for charging the cells with coal, at their rear ends with an opening for the discharge of the coke and at their front ends with an opening for the passage of a ram to push the coke through the rear openings, and in which each pier is divided internally and vertically into flues by spacer elements, the walls of the piers also constituting the walls of the adjacent oven cells with each wall being formed by a stack of horizontal courses of bricks, each course comprising stretchers arranged adjacent the flues and headers projecting into the course from every other spacer element so that two headers in one course are separated by two adjacent stretchers and with the joint between two adjacent stretchers of a course being located between the headers in the immediately adjacent upper and lower courses and next to a spacer element without headers,

the improvement comprising repairing said battery of coke ovens to provide a continuous vertical joint plane in the walls of the piers near at least one of the ends of the cells, said joint plane extending along one of the lateral faces of a header, one of the two adjacent stretchers in the courses immediately above and below said header being longer than the other stretchers and the other being shorter so that their assembly joint is located in the same vertical joint plane as the said one of the lateral faces of said header, said method comprising

(a) demolishing the ends of the piers to be repaired as far back as required and to be able to form said vertical joint plane, this vertical joint plane being located along a vertical alignment of one of the lateral faces of a header,

(b) removing the stretchers which are located between the header adjacent to this joint plane being removed and replaced by stretchers of greater length so that their end faces will be located in this vertical joint plane, said longer stretchers containing a vertical groove on the exposed face,

(c) cutting a cooperating vertical groove in the exposed lateral faces of the headers and in the end faces of the shorter stretchers and normal stretchers required to form this joint plane, and

(d) inserting a rod in the groove between the new normal stretchers and headers and between the longer and shorter stretchers.

4,545,861

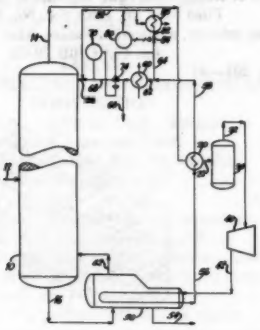
FRACTIONATION SYSTEM

John E. Idenden, Belleville, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 283,231, Jul. 14, 1981, Pat. No. 4,395,310. This application Apr. 21, 1983, Ser. No. 487,292

Int. Cl.[4] B01D *3/42*

U.S. Cl. 203—2 **7 Claims**



1. In a method for conserving energy and reducing the external energy input to a fractionation system comprising a fractionation zone, a reboiler zone communicating with the fractionation zone, and a compression zone communicating with the fractionation zone and the reboiler zone, comprising:

a. introducing hydrocarbon feed into the fractionation zone, the fractionation zone adapted to separate the feed into an overhead fraction and a bottoms fraction;

b. passing at least a portion of the bottoms fraction from the fractionation zone through a reboiler zone for reheating;

c. passing bottoms fraction from the reboiler zone through a compression zone to compress the bottoms fraction prior to the bottoms fraction returning to the fractionation zone;

d. passing all the overhead fraction from the fractionation zone through the reboiler zone, the overhead fraction transferring heat to the bottoms fractions;

e. returning overhead fraction to the fractionation zone from the reboiler zone; and,

f. monitoring the composition of at least one of the fractions separated in the fractionation zone; the improvement comprising:

A. adding energy to the overhead fraction from an external source prior to returning the overhead fraction to the fractionation zone to thereby increase the rate of production of overheads; and,

B. regulating the rate of external energy addition to the overhead fraction returned to the fractionation zone to thereby maintain the separated fractions within the desired limits and thereby reduce the energy input to the fractionation system as compared to a fractionation system having no compression zone.

4,545,862

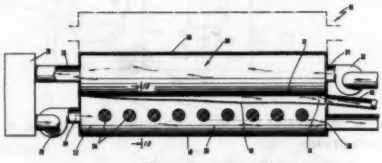
DESALINATION DEVICE AND PROCESS

Wilbert L. Gore; Robert W. Gore, both of Newark, Del., and David W. Gore, Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Del.

Continuation-in-part of Ser. No. 244,724, Mar. 17, 1981, abandoned, which is a continuation-in-part of Ser. No. 143,724, Apr. 25, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 354,140

Int. Cl.[4] B01D *3/00*; **C02F** *1/04*

U.S. Cl. 203—10 **24 Claims**



21. Method of continuously distilling a hot aqueous feed containing a low volatility solute such as salt comprising the steps of:

(a) flowing the hot feed past, and in intimate contact with, one side of a microporous membrane;

(b) diffusing water vapor through the membrane;

(c) condensing the diffused water vapor using an impermeable sheet positioned on the side of the microporous membrane opposite the hot feed, the condensing step including the steps of collecting the condensed vapor in the chamber defined in part by the microporous membrane and the impermeable sheet, and intimately contacting both the membrane and the sheet with the collected distillate;

(d) stripping the condensed and collected distillate from the chamber using forces exerted by the hot flowing feed flow acting across the microporous membrane on the distillate sandwiched between the membrane and the sheet, the forces causing distillate flow in the same direction as hot feed flow, said stripping step including the step of locally deforming the microporous membrane relative to the impermeable sheet and in a direction normal to the sheet to allow passage of the distillate in the direction of the hot feed flow; and

(e) draining the flowing distillate from the collecting chamber along the direction of hot feed flow.

4,545,863

AUTOMATED MEMBRANE TEST CELL APPARATUS AND METHOD FOR SO USING

Howard L. Yeager, and J. David Malinsky, both of Calgary, Canada, assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 420,413, Sep. 20, 1982, Pat. No. 4,483,748. This application Dec. 30, 1983, Ser. No. 567,019

Int. Cl.[4] G01N *27/28, 27/40*

U.S. Cl. 204—1 T **32 Claims**

1. An automatic electrochemical membrane test cell apparatus for measuring the cationic and water transport, voltage

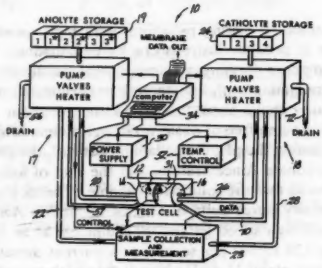
drop and power consumption properties of a cation exchange permselective membrane during electrolysis, said apparatus comprising:

(a) a pair of half cells, each containing a horizontally disposed inner chamber, said cell being formed by joining said half cells so that said chambers are horizontally aligned and abut each other to form an electrolytic cell;

(b) means for sealingly suspending said membrane between said half cells thereby separating said half cells into a separate anode compartment and a separate cathode compartment;

(c) a plurality of reference electrode means, at least one of which is located in each of said half cells for measuring the voltage drop across and enabling the power consumption within said membrane to be determined;

(d) electrolyte fluid storage means comprising a first plurality of individual storage containers for storing anolyte solutions of varying concentration, each of said anolyte solutions being paired with one of identical concentration before one of said anolyte solutions has a preselected amount of radioactive tracer added thereto and a second plurality of individual storage containers for storing catholyte solutions of varying concentration;



(e) means for sequentially introducing a selected one of said anolyte solutions into said anode compartment and a selected one of said catholyte solutions into said cathode compartment;

(f) heating means for heating and holding said selected anolyte and catholyte solutions at a preselected temperature;

(g) electrode means forming an anode in said anode compartment and a cathode in said cathode compartment;

(h) means for selecting and implementing a test program wherein the amperage applied to said electrodes for said electrolysis is programmably changed from a first discrete value of current density to at least a second discrete value of current density during the course of a test;

(i) means for sequentially controlling the filling and draining of said selected anolyte and catholyte solutions to monitor and control their flow within said cell; and

(j) means for generating test samples taken from said selected anolyte and catholyte solutions, the means for generating test samples first measuring changes in the concentrations of said selected anolyte and catholyte solutions resulting from said electrolysis and then determining a water and cationic test data point and the voltage drop and power consumption for said membrane and each pair of said selected anolyte and catholyte solutions.

4,545,864

SELECTIVE PLATING

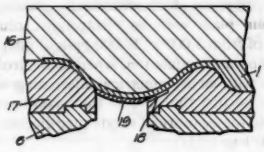
Michael A. Richards, Delapre, England, assignor to S.G. Owen Limited, Northampton, England

Filed Oct. 3, 1983, Ser. No. 538,655

Claims priority, application United Kingdom, Oct. 5, 1982, 8228379

Int. Cl.⁴ C25D 5/02

U.S. Cl. 204—15 **13 Claims**



1. A method of selectively jet-plating a component, which method comprises contacting the component with a mask so as to expose an area to be plated and selectively jet-plating the said area, wherein the shape of the mask is such that the plating rate is not the same at all points on the said area.

4,545,865

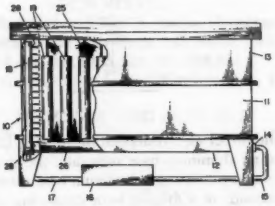
METHOD FOR ELECTRODEPOSITION OF MATERIALS

Paul R. Stubb, 3032 Stearns Dr., Orange, Calif. 92669

Division of Ser. No. 427,849, Sep. 29, 1982, Pat. No. 4,492,621. This application Oct. 9, 1984, Ser. No. 658,659

Int. Cl.⁴ C25D 5/08

U.S. Cl. 204—23 **3 Claims**



1. In a method of forming an electroplated article in an electrodeposition cell wherein an anode means and a cathode means are at least partially submerged in an electrolyte contained in the tank of said cell and wherein material from the anode is deposited on the cathode by means of electrodeposition from an electrolyte, the improvement comprising confining a portion of said electrolyte in the area of said cathode by positioning a material which will confine electrolyte in the area of said cathode while at the same time permitting ions to be freely exchanged between said anode and cathode means when said cell is in operation and inducing a high velocity flow of electrolyte parallel to the face of the cathode through said confined area from said electrodeposition cell whereby the volume of electrolyte per unit time around said cathode is increased.

4,545,866
PROCESS FOR PRODUCING SUPPORT FOR PLANOGRAPHIC PRINTING

Hisao Ohba; Akira Shirai; Etsuo Kitazumi, and Norihiko Kato, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

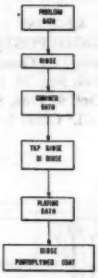
Filed Jul. 18, 1984, Ser. No. 632,148
Claims priority, application Japan, Jul. 18, 1983, 58-130440
Int. Cl.[4] C25D *5/44*; C25F *3/04*
U.S. Cl. 204—33 11 Claims

1. A process for producing a support for planographic printing which comprises electrochemically graining the surface of an aluminum plate with an electrolytic solution consisting essentially of from 1,000 to 40,000 ppm of nitric acid and from 50 to 4,000 ppm of sulfate ion, wherein electrolytic graining is carried out with an asymmetrical alternating wave form electric current so that the ratio of the quantity of cathode time electricity to the quantity of anode time electricity is in a range of from 0.4/1 to 1.25/1.

4,545,867
PROCESS FOR THE DIRECT ELECTRODEPOSITION OF GRAY CHROMIUM ON ALUMINUM BASE SUBSTRATES SUCH AS ALUMINUM BASE LITHOGRAPHIC SHEETS

John A. Ballarini, 1116 Virginia St., Racine, Wis. 53405, and Timothy A. Hetland, 1916 Philips Ave., Racine, Wis. 53403

Continuation of Ser. No. 253,223, Apr. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 34,179, Apr. 27, 1979, abandoned. This application Oct. 18, 1983, Ser. No. 542,095
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.[4] C25D *5/44*
U.S. Cl. 204—33 3 Claims



1. In the direct electrodeposition of gray chromium on the surface of an aluminum base substrate, the steps of

immersing a precleaned aluminum base substrate for at least 10 seconds in a grainer bath consisting of about 4 to 16 ounces of a bifluoride selected from the group consisting of ammonium bifluoride or sodium bifluoride per gallon of water maintained at a temperature in the range of about 80° to 160° F.,

immediately rinsing said aluminum base substrate with water to remove grainer bath solution therefrom,

immersing said rinsed and grained aluminum base substrate without intermediate drying thereof in an electroplating bath selectively consituted of water, chromic oxide and sulfuric acid in amounts to maintain a Cr^{+6}/SO_4^{-2} ratio in the range of about 75 to 180,

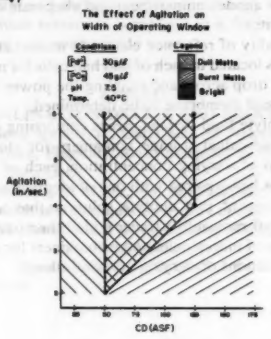
exposing said immersed metal substrate in said plating bath to a plating current in the range of 300 to 1000 amperes per square foot for at least 30 seconds,

and maintaining said plating bath at a temperature in the range of about 70° to 100° F. while plating current flows therein.

4,545,868
PALLADIUM PLATING

James L. Martin, Merrick; John E. McCaskie, North Merrick, and Michael P. Toben, Oceanside, all of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Continuation of Ser. No. 549,375, Nov. 7, 1983, abandoned, which is a continuation of Ser. No. 309,096, Oct. 6, 1981, abandoned. This application Aug. 10, 1984, Ser. No. 639,401
Int. Cl.[4] C25D *3/50*
U.S. Cl. 204—47 15 Claims



1. A method of plating palladium with high speed plating equipment to produce lustrous crack-free palladium deposits which comprises forming an ammoniacal palladium plating solution containing a phosphate and/or carbonate anion at a concentration above about 7.5 g/l and below about 150 g/l, said solution being free of quaternized pyridinium brightening agents; adjusting the pH, the palladium content, the phosphate and/or carbonate concentration, and the rate of agitation of the solution so that the solution is capable of being plated at a current density range delta of at least about 200 ASF when plating with high speed jet stream equipment at an agitation rate above 120 inches per second or a current density range delta of above about 37 ASF when plating with cathode agitation equipment at an agitation of above about 3 inches per second, and plating the palladium from such solutions with high speed jet stream equipment or cathode movement equipment at an ASF above 50.

4,545,869
BATH AND PROCESS FOR HIGH SPEED ELECTROPLATING OF PALLADIUM

Irina Goldman, Brooklyn, N.Y., assignor to OMI International Corporation, Warren, Mich.

Filed Jan. 29, 1985, Ser. No. 694,939
Int. Cl.[4] C25D *3/52*
U.S. Cl. 204—47 15 Claims

1. An improved bath for electroplating highly ductile palladium metal, said bath comprising from about 10 to 80 g/l of palladium metal in the form of a palladium amine complex; about 20 to 90 g/l of ammonium sulfate; about 10 to 80 g/l of ammonium halide; from about 20 to 150 g/l of an alkali metal pyrophosphate; a stress reducing agent; and a minor amount of cyanide ions.

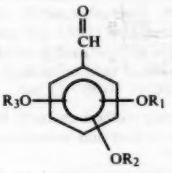
4,545,870
AQUEOUS ACID PLATING BATH AND BRIGHTENER COMPOSITION FOR PRODUCING BRIGHT ELECTRODEPOSITS OF TIN

William E. Rosenberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Macedonia, Ohio

Filed Aug. 27, 1984, Ser. No. 644,391
Int. Cl.⁴ C25D 3/32
U.S. Cl. 204—54 R 25 Claims

13. An aqueous acid electroplating bath containing stannous ions and sulfuric acid for producing electrodeposits of tin, comprising:

from about 0.005 to about 0.5 grams per liter of bath solution of a primary brightener, said primary brightener being a compound selected from the group consisting of trialkoxybenzaldehydes having the following general formula:

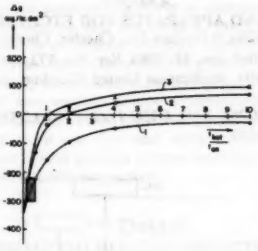


where R_1, R_2, and R_3 can be the same or different and are methyl, ethyl, propyl, or isopropyl groups.

4,545,871
METHOD OF MAKING AN ARTICLE HAVING A LAYER OF A NICKEL-PHOSPHORUS ALLOY AND COATED WITH A PROTECTIVE LAYER

Gerrit Krijl, and Renaat E. Van de Leest, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 491,101, May 3, 1983, Pat. No. 4,497,877.
This application Nov. 2, 1984, Ser. No. 667,936
Claims priority, application Netherlands, May 6, 1982, 8201849
Int. Cl.⁴ C25D 11/36, 11/38
U.S. Cl. 204—56 R 3 Claims

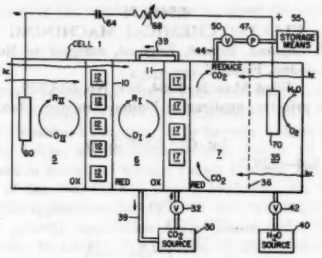


1. A method of producing a protective layer consisting of a nickel-free conversion layer of a hydrated basic chromium phosphate which comprises the components $CrPO_4$ and $Cr(OH_3)$, wherein $Cr_2(SO_4)_3$ may be present and in which the weight ratio Cr:P:S = 1:(0.2–1.5):(0–0.5) on an article coated with a layer consisting of a nickel-phosphorus alloy, by treating the coated article in an aqueous solution containing chromate ions characterized in that the coated article is connected as an electrode in aqueous solution of chromic acid at ambient temperature, the electrode being subjected to a periodically reversed current with a frequency between 0.1 and 50 Hz with a current density between 0.2 and 1 A/dm² and a ratio of cathodic to anodic pulse durations between 0.05 and 20.

4,545,872
METHOD FOR REDUCING CARBON DIOXIDE TO PROVIDE A PRODUCT

Anthony F. Sammells, and Peter G. Pa Ang, both of Naperville, Ill., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 27, 1984, Ser. No. 593,221
Int. Cl.⁴ C25B 3/04
U.S. Cl. 204—72 18 Claims



8. A process for reducing carbon dioxide to at least one useful product comprising the steps of:

a. providing a R_{II}/O_{II} redox coupled electrolyte solution,

b. electrically connecting first and second membranes having photosensitizers with the second membrane having a catalyst,

c. providing carbon dioxide to the second membrane,

d. providing water,

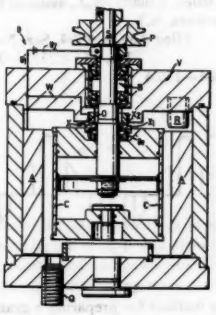
e. separating the water from the second membrane in a manner so that hydrogen ions, but not oxygen, may pass from the water to participate in the reduction of the carbon dioxide at the surface of the second membrane,

f. illuminating both membranes so as to produce excited photosensitizers to cause electron transfer from the R_{II}/O_{II} solution to the carbon dioxide thereby reducing the carbon dioxide to provide products.

4,545,873
VESSEL FOR AN UNSTABLE SOLUTION OF A METAL SALT OR COMPLEX AND METHOD FOR SEALING SUCH VESSEL

Colin C. Blake, Rochford, and Paul A. Bacon, Hornchurch, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jan. 10, 1983, Ser. No. 456,895
Claims priority, application United Kingdom, Jan. 19, 1982, 8201366
Int. Cl.⁴ C25C 1/20; C25D 17/00, 21/10
U.S. Cl. 204—109 7 Claims



1. A method of sealing a pressurised vessel which has a reciprocating or rotating shaft and which contains an unstable

solution of a metal salt or complex, said method comprising forming a seal for the shaft composed at least in part of an electro-conductive material, inserting in the body of the vessel a counter-electrode electrically connected to the shaft and applying a voltage across the seal and the counter-electrode so that the seal is made the anode electrode of the thus formed cell.

4,545,874

ELECTRO CHEMICAL MACHINING

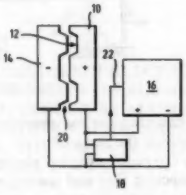
David R. England, Bristol, England, assignor to Rolls-Royce Ltd., London, England

Filed May 24, 1984, Ser. No. 613,529

Claims priority, application United Kingdom, Jun. 3, 1983, 8315384

Int. Cl.⁴ B23P *1/00*

U.S. Cl. 204—129.2 **7 Claims**



1. A method of disabling an electro chemical machine tool having a machining gap comprising the steps of:

filtering electrical noise signals which are generated across the machining gap by operation of the machine tool and by generation of sparks across the machining gap;

generating a stream of pulses representative of the filtered signal, each pulse having a substantially uniform duration and a height representative of the amplitude of the filtered signal at the time the pulse is generated;

detecting which pulses have at least a given amplitude;

dividing the detected pulses into two streams and passing both streams to a common input point, each pulse of one stream being passed to the common input point without substantial delay and each pulse of the other stream being passed after being delayed by a time period corresponding to the period of time over which spark signals are produced; and

if pulses in each stream reach said common input point substantially simultaneously, deriving a signal therefrom with which to disable the machine tool.

4,545,875

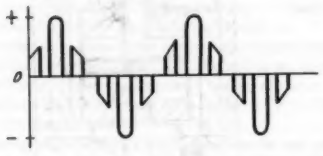
ELECTROLYTIC GRAINING

Donald J. Riley, Tenafly, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Filed Aug. 6, 1984, Ser. No. 638,313

Int. Cl.⁴ C25F *3/04*

U.S. Cl. 204—129.4 **5 Claims**



1. In the method for preparing a grained aluminum support for lithographic printing plates comprising the treatment of an aluminum plate disposed within an electrolytic bath to a shaped alternating current, the improvement which comprises utilizing a shaped alternating current having a wave form that includes multiple zero voltage intermissions in both cathode and anode phases of said wave form.

4,545,876

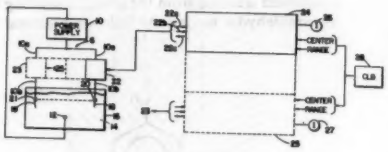
METHOD AND APPARATUS FOR SURFACE TREATING

James F. McGivern, Jr., Avon, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1984, Ser. No. 606,056

Int. Cl.⁴ C25D *11/02, 21/12;* C25F *1/00*

U.S. Cl. 204—130 **8 Claims**



1. A surface treating method characterized by:

applying current to first and second articles in a treating solution;

providing a first preset signal that manifests the maximum acceptable individual treating current for the articles;

providing a second preset signal that manifests the minimum acceptable individual treating current for the articles;

sensing current in the first article to provide a first current signal which manifests a first particular magnitude current in the first article;

sensing the current in the second article to provide said first current signal for said first particular magnitude current in the second article;

using the first current signal for each article and the first and second preset signals to provide a current control signal for each article when the first current signal for the article is more than said maximum current or less than said minimum current;

monitoring for the presence of the control signal.

4,545,877

METHOD AND APPARATUS FOR ETCHING COPPER

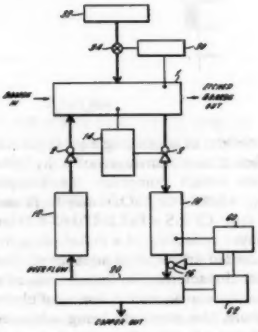
Maurice R. Hillis, 9 Newton La., Chester, Cheshire, England

Filed Jan. 19, 1984, Ser. No. 572,084

Claims priority, application United Kingdom, Jan. 20, 1983, 8301507

Int. Cl.⁴ C25F *5/00;* C25C *1/12, 7/00;* C25D *21/18*

U.S. Cl. 204—130 **20 Claims**



1. In a method for etching copper from articles which com-

prises contacting the articles with an etchant solution containing cupric tetrammine ions to remove copper from the articles at an etching station whereby the concentration of copper in the etchant solution increases, transferring the etchant solution to an electrochemical cell, removing the copper from the etchant solution as metal by electrochemical reduction in the cell, and returning the etchant solution to the etching station, the improvement which comprises transferring the etchant solution to the cathode compartment only of the electrochemical cell, the cell being divided into anode and cathode compartments by an ion exchange membrane.

4,545,878

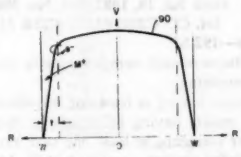
METHOD AND APPARATUS FOR SEPARATING ISOTOPES USING ELECTROPHORESIS IN A DISCHARGE

William B. Bridges, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 151,217, May 19, 1980, abandoned, which is a division of Ser. No. 700,362, Jun. 28, 1976, abandoned. This application May 6, 1982, Ser. No. 375,504

Int. Cl.⁴ B01D *59/00*

U.S. Cl. 204—157.1 R **3 Claims**



1. A method for separating isotopes of a gaseous mixture containing elementary particles of first and second isotopes comprising the steps of:

exposing said gaseous mixture to radiation at a predetermined frequency to excite elementary particles of said first isotope without substantially exciting elementary particles of said second isotope;

establishing an electric discharge in said gaseous mixture in a region where it is exposed to said radiation to produce preferential positive ionization of elementary particles of said first isotope, said discharge forming a plasma sheath at its lateral extremity, whereby elementary particles of said first isotope preferentially migrate to a first location in the vicinity of said lateral extremity and elementary particles of said second isotope preferentially migrate to a second location away from said lateral extremity; and

removing from said first and second locations respective portions of said gaseous mixture enriched in said first and second isotopes, respectively.

4,545,879

HYDRODESULPHURIZATION OF HYDROCRACKED PITCH

Jeffrey K. S. Wan, Kingston, and Jaroslav F. Kriz, Nepean, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources, Ottawa, Canada

Filed Jul. 13, 1984, Ser. No. 630,741

Claims priority, application Canada, Jul. 14, 1983, 432474

Int. Cl.⁴ B01J *19/12*; **C10G** *32/00*; **C10L** *9/04*

U.S. Cl. 204—158 R **8 Claims**

1. A method of desulphurizing a petroleum pitch containing organic molecules having at least some chemically bound sulphur, comprising the steps of:

(a) effecting intimate mixing between particles of petroleum pitch and particles of a para- or ferromagnetic metallic catalyst,

(b) subjecting the pitch-catalyst particulate mixture in the presence of hydrogen to a train of short pulses of microwave radiation so as to generate a high intensity oscillating electric field thereby creating a microwave enhanced surface reaction whereby chemically bound sulphur in the pitch particles reacts with the hydrogen and is released from the pitch particles as sulphur-containing gases without substantial increase of the temperature of the pitch particles, and

(c) separating the sulphur-containing gases thus formed.

4,545,890

PHOTOCHEMICAL PROCESS FOR PREPARING CAMPTOTHECIN DERIVATIVES

Tadashi Miyasaka, Kanagawa; Seigo Sawada, Tokyo; Kenichiro Nokata, Tokyo, and Masahiko Mutai, Tokyo, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

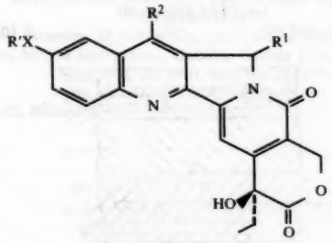
Division of Ser. No. 413,879, Sep. 1, 1982, Pat. No. 4,473,692. This application Jul. 18, 1984, Ser. No. 632,039

Claims priority, application Japan, Sep. 4, 1981, 56-138410; Sep. 4, 1981, 56-138411; Feb. 5, 1982, 57-16370; Mar. 5, 1982, 57-34094

Int. Cl.⁴ B01J *19/12*

U.S. Cl. 204—158 R **3 Claims**

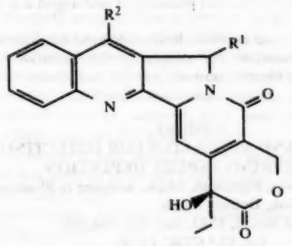
1. A process for the preparation of 10-substituted camptothecin derivatives of the general formula:



(I')

wherein R^1 stands for a hydrogen atom, an alkyl group, a hydroxyl group, an alkoxy group or an acyloxy group, R^2 for a hydrogen atom, an alkyl group, an aralkyl group, a hydroxymethyl group, carboxymethyl group or an acyloxymethyl group, R' for a hydrogen atom, an alkyl group or an acyl group and X for an oxygen atom or a sulfur atom,

characterized by treating a 5- and/or 7-substituted camptothecin derivative of the general formula:



(II)

wherein R^1 and R^2 have the same meanings as given above, with a peroxidant in a liquid vehicle and then reacting the resultant 5- and/or 7-substituted camptothecin-1-oxide derivative with an active hydrogen-containing reagent of the general formula:

R'—X—H (III)

wherein R' and X have the same meanings as given above, in the presence of an acid under irradiation of ultraviolet rays.

4,545,881

METHOD FOR PRODUCING ELECTRO-THERMAL TRANSDUCER

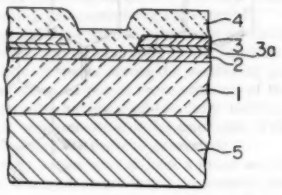
Akira Shinmi, Kawasaki; Masahisa Fukui, Yokohama; Toshitami Hara, Tokyo; Yoshiaki Shirato, Yokohama, and Yoshioki Hajimoto, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 266,219, May 22, 1981, abandoned, which is a division of Ser. No. 906,359, May 15, 1978, Pat. No. 4,296,309. This application Nov. 16, 1983, Ser. No. 552,013

Claims priority, application Japan, May 19, 1977, 52-57936; Aug. 30, 1977, 52-103975; Sep. 7, 1977, 52-107522; Sep. 16, 1977, 52-111329; Oct. 13, 1977, 52-122622; Oct. 13, 1977, 52-122623; Oct. 13, 1977, 52-122624; Oct. 13, 1977, 52-122625; Oct. 28, 1977, 52-129482; Oct. 28, 1977, 52-129483; Oct. 28, 1977, 52-129484; Oct. 28, 1977, 52-129485; Oct. 28, 1977, 52-129486; Oct. 31, 1977, 52-131260; Oct. 31, 1977, 52-131261; Oct. 31, 1977, 52-131262; Dec. 28, 1977, 52-160137; Dec. 28, 1977, 52-160138; Dec. 28, 1977, 52-160139; Dec. 28, 1977, 52-160140; Dec. 28, 1977, 52-160143; Dec. 28, 1977, 52-160144; Dec. 28, 1977, 52-160145; Dec. 28, 1977, 52-160146; Dec. 28, 1977, 52-160147; Dec. 28, 1977, 52-160148; Dec. 28, 1977, 52-160149; Jan. 9, 1978, 53-1033; Jan. 9, 1978, 53-1034; Jan. 9, 1978, 53-1035; Jan. 11, 1978, 53-1806; Feb. 10, 1978, 53-14282; Feb. 10, 1978, 53-14283

Int. Cl.⁴ C23C *15/00*

U.S. Cl. 204—192 SP **8 Claims**



1. A process for producing an electro-thermal transducer comprising:

(a) forming a layer of a resistive heater element including a metal boride on a substrate of an electrically insulative material by conducting a reactive sputtering reaction between a target of an elemental form of said metal and diborane gas in a gaseous atmosphere of argon and diborane, wherein the partial pressure of diborane is from 1–10% based on the total pressure of said argon and diborane; and

(b) applying to said resistive heater element an electrically conductive member for supplying the resistive heater element with electric power.

4,545,882

METHOD AND APPARATUS FOR DETECTING SPUTTERING TARGET DEPLETION

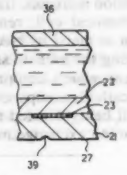
Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Sep. 2, 1983, Ser. No. 528,951

Int. Cl.⁴ C23C *15/00*

U.S. Cl. 204—192 R **17 Claims**

1. The method of monitoring the erosion of a magnetron sputtering target in the process of sputtering a selected coating material on the target to form a thin film of the coating material on relatively flat substrates that are moved successively through a sputtering chamber, the improvement comprising, providing a thin layer of a detectable material which is distinguishable from the material to be sputter coated between the selected coating material and the target, monitoring the substrates that have received the sputtered coating material for a trace of the detectable material as an indication that the selected coating material on the target is near depletion and ceasing the sputtering and replacing the target when the detectable material is detected.



4,545,883

ELECTROLYTIC CELL CATHODE

Stanford R. Ovshinsky, Bloomfield Hills; Krishna Sapru, Troy, and Edmund L. Yee, Warren, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 19, 1982, Ser. No. 399,892

Int. Cl.⁴ C25C *15/00*; C25B *11/00*

U.S. Cl. 204—192 SP **25 Claims**

1. A multicomponent compositionally disordered catalytic material comprising:

a host matrix having at least one transition element; and

said host matrix having incorporated therein one or more modifier elements, at least one said modifier element selected from a group consisting of Ti, Mo, Si, La, Ta, Ce, Zn, O, Cr, Nb, Cu, Fe, V, and Mish-metal, said modifier element modifying the local structural chemical environments of said material to provide the disorder throughout the bulk of the material and create an increased density of catalytically active sites for acting as a catalyst for a hydrogen evolution in an electrolytic cell, said material having at least one amorphous phase, microcrystalline phase, polycrystalline phase lacking long-range order, or any combination of these phases.

4,545,884

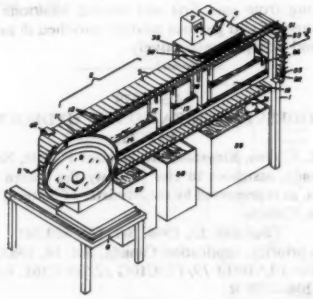
HIGH FREQUENCY ELECTROPLATING DEVICE

William L. Francis, 18 Chimney Wood, Floyd Knobs, Ind. 47119

Filed May 21, 1984, Ser. No. 612,244

Int. Cl.⁴ C25D *17/00, 17/06, 17/28*

U.S. Cl. 204—202 **4 Claims**



1. Apparatus for continuous electroplating of a portion of the inner surface of an elongate generally tubular metallic article s including:

(a) moving conveyor means having tubular elongate electrically nonconductive holder means to receive said articles

so the portion of article to be electroplated extends downwardly from the conveyor to the end of said holder means;

(b) solution reservoir means to receive a selected solution to contact the parts to be electroplated where the reservoir is located beneath the conveyor means in aligned relation with the conveyor means so the portion of the articles to be electroplated pass through the solution in the reservoir with movement of the conveyor; and

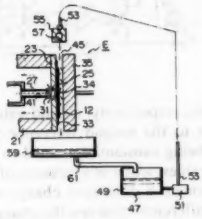
(c) vibration generating means to vibrate the solution in the reservoir at a frequency greater than sonic frequency.

4,545,885

SELECTIVE ELECTROPLATING APPARATUS HAVING A CLEANING DEVICE

Kuniyuki Hori, Suzaka, and Kiyoshi Kitazawa, Kohshoku, both of Japan, assignors to Shinko Electric Industries Co., Inc., Nagano, Japan

Filed Aug. 14, 1984, Ser. No. 640,578
Claims priority, application Japan, Jun., 1984, 59-110937
Int. Cl.[4] C25D *17/00, 19/00*
U.S. Cl. 204—207 **21 Claims**



1. A selective electroplating apparatus to be used in an electroplating process, commprising:

(a) means for supporting a metal strip of lead frame between a masking member having a masking aperture and a back-up plate;

(b) means for spraying electroplating liquid through the masking aperture of the masking member onto a selective area of the lead frame strip;

(c) means for supplying electric voltage between an anode and the lead frame strip which has been cathodically charged to form an electroplated layer on the selective area of the strip;

(d) means for moving the masking member and the back-up plate toward each other to support and contact the strip therebetween and away from each other to define a clearance therebetween in each cycle of the electroplating process; and

(e) means for spraying cleaning liquid into said clearance defined between said masking member and back-up plate after the masking member and the back-up plate are moved away from each other.

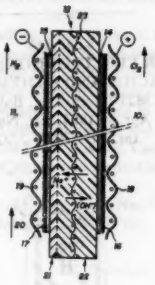
4,545,886

NARROW GAP ELECTROLYSIS CELLS

Vittorio de Nora, Nassau, The Bahamas, and Henri B. Beer, Heide-Kalmthout, Belgium, assignors to ELTECH Systems Corporation, Boca Raton, Fla.

PCT No. PCT/EP82/00236, § 371 Date Jun. 21, 1983, § 102(e) Date Jun. 21, 1983, PCT Pub. No. WO83/01630, PCT Pub. Date May 11, 1983
PCT Filed Oct. 26, 1982, Ser. No. 506,436
Int. Cl.[4] C25B *9/00, 11/02, 11/08, 11/10*
U.S. Cl. 204—252 **21 Claims**

1. A narrow gap electrolysis cell having anode and cathode compartments divided by an ionically-permeable separator, the anode and cathode compartment containing an anode and a cathode at least one of which comprises a current feeder grid in electrical contact with a particulate electrocatalytic material carried on a face of said separator as an integral part thereof, said particulate electrocatalytic material comprising surface-



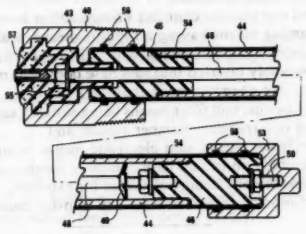
activated particles having a core of corrosion-resistant non-precious material and an outer surface containing at least one platinum-group metal electrocatalyst in metal and/or oxide form.

4,545,887

ELECTRODE FOR ELECTROSTATIC WATER TREATMENT

Tore C. Arnesen, 23 Linden Cir., and Tore Arnesen, 25 Linden Cir., both of Georgetown, Ontario, Canada L7G 4Y7

Filed Nov. 21, 1983, Ser. No. 554,070
Int. Cl.[4] C25B *11/00;* **C25D** *17/10*
U.S. Cl. 204—280 **7 Claims**



1. Electrode for electrostatic treatment of water, comprising:

an elongate core, at least a portion of which is metal connectable to a source of high voltage;

an insulative sleeve formed of a thin film of plastic, which surrounds and encases the exterior surface of the core;

respective end bosses, insulated from the core, one at each end of the core; wherein each boss includes a groove which encircles the plastic film;

an elastomeric seal located in the groove, and so dimensioned as to be squeezed radially onto the outer surface of the plastic film;

fastener means, by which the bosses are attached to the ends of the core;

wherein the fastener means includes a clamping means for exerting a clamping force directed axially with respect to the core for clamping the bosses firmly, rigidly and tightly to the core;

wherein the electrode is self-contained as to its structural integrity, in that neither the said clamping force nor the reaction to the said clamping force is taken by or transmitted through a surrounding tank, or jacket, pipe, casing, conduit, tube, or vessel of any kind;

and one of the end bosses includes a mounting means by which the electrode may be mounted to, and sealed with respect to, a hole in plate or sheet material comprising a wall of a vessel.

4,545,888

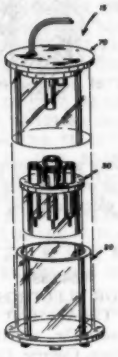
APPARATUS FOR ELECTROPHORETIC RECOVERY OF NUCLEIC ACIDS AND OTHER SUBSTANCES

J. William Walsh, 3823 Beech Ave., Baltimore, Md. 21211

Filed Apr. 6, 1984, Ser. No. 597,677

Int. Cl.[4] G01N *27/28*

U.S. Cl. 204—301 **10 Claims**



1. An apparatus for the recovery of nucleic acids and other substances, comprising:

a base container means;

at least one transfer chamber means, said at least one transfer chamber means having a support means, said at least one transfer chamber means with said support means being removably inserted into said base container means, said at least one chamber means having a interior;

a filter means, said filter means being suitably supported in at least one transfer chamber means; and

an electrode means, said electrode means being removably assembled on to said base container means, said electrode means thereby being positioned for extending directly into said interior of said at least one transfer chamber means.

4,545,889

GAS ANALYSIS APPARATUS

Cornelis Franx, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

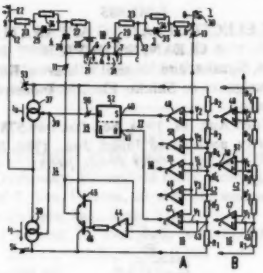
Filed Dec. 5, 1984, Ser. No. 678,328

Claims priority, application Netherlands, Dec. 6, 1983, 8304182

Int. Cl.[4] G01N *27/58*

U.S. Cl. 204—406 **5 Claims**

1. A gas analysis apparatus for measuring the concentration of a gas component in a first space comprising: a sealed measurement space, of which at least one wall portion includes a separation wall which exhibits ionic conduction and is in contact at least in part via an outer side with the first space, a control unit which supplies periodically during a pumping time interval a pumping current to the separation wall so that by means of an ion current in the separation wall the gas component is removed from the measurement space, and which supplies during a filling time interval a filling current whose polarity is opposite to that of the pumping current so that the gas component is supplied to the measurement space, a detection circuit connected to electrode layers on either side of the separation wall, the outer electrode layer of which is in contact with the first space, said detection circuit comprising a first voltage detector which supplies a filling interrupt signal for interrupting the filling current when the electrode voltage across the said electrode layers reaches a first reference value, and a second voltage detector which supplies a pumping interrupt signal for interrupting the pumping current when the electrode voltage reaches a second reference value, the electrical charge provided in the separation wall being measured as a measure of the concentration of the gas component, characterized in that the detection circuit further comprises a third, a fourth and a fifth voltage detector, which supply output signals when the electrode voltage reaches a third, a fourth and a fifth



reference value, respectively, all said values lying in the range from the first to the second reference value and twice the fourth value being substantially equal to the sum of the third and the fifth values, while as a measure of the concentration of the gas component a difference charge is measured which is equal to the difference between the charge displaced in a first time interval limited by the instants at which the third and the fourth voltage detectors supply their output signals and the charge displaced in a second time interval limited by the instants at which the fourth and the fifth voltage detectors supply their output signals.

4,545,890

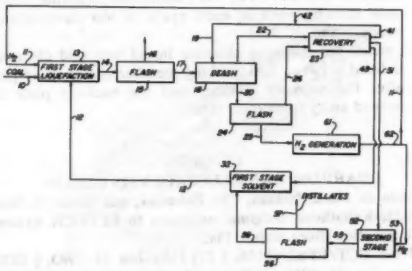
COAL LIQUEFACTION AND HYDROGENATION

Harvey D. Schindler, Fair Lawn, and James M. Chen, Edison, both of N.J., assignors to Lummus Crest, Inc., Bloomfield, N.J.

Filed Apr. 30, 1984, Ser. No. 605,764

Int. Cl.[4] C10G *1/06*

U.S. Cl. 208—8 LE **18 Claims**



1. A two-stage process for the liquefaction of coal, comprising:

contacting coal with liquefaction solvent in a first stage to produce a first effluent containing 850° F.− material and 850° F.+ material; recovering from the first effluent a feed (mixture) material comprising at least a portion of the 850° F.− material and 850° F.+ material; hydrogenating

said feed (mixture) material in a second stage at a temperature of from 650° F. to 795° F. and at an overall conversion, based on 850° F.+ material, of at least 30% and no greater than 60% to produce a second effluent comprising 850° F.− material and 850° F.+ material; recovering from the second effluent a portion of the 850° F.− material as product, and a mixture of 850° F.− material and 850° F.+ material, said mixture having a ratio of 850° F.− material to 850° F.+ material of from 0.8:1 to 6:1; and directly employing said mixture, without additional hydrogenation, as at least a portion of the liquefaction solvent used in the first stage, said liquefaction solvent being comprised of from 0% to 40% of 850° F.− material having an initial boiling point of at least 500° F. recovered from the first stage effluent, and said mixture in an amount from 60% to 100% (of said mixture), all by weight.

4,545,891

EXTRACTION AND UPGRADING OF FOSSIL FUELS USING FUSED CAUSTIC AND ACID SOLUTIONS

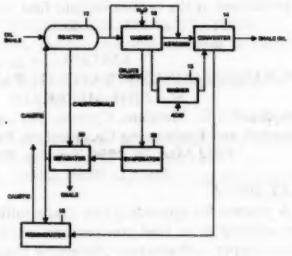
Robert A. Meyers, Tarzana, and Walter D. Hart, Upland, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

PCT No. PCT/US82/00394, § 371 Date Mar. 10, 1983, § 102(e) Date Mar. 10, 1983, PCT Pub. No. WO82/03404, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 30, 1982, Ser. No. 486,276

Int. Cl.⁴ C10G *1/00*

U.S. Cl. 208—11 R **22 Claims**



1. A process for the extraction of kerogen from oil shale comprising the steps of:

dispersing one part by weight of the oil shale in at least four parts by weight fused alkali metal caustic,

(b) maintaining the dispersion at a treating temperature in the range of about 250° C. to about 400° C. for at least five minutes, whereby kerogen is released from said oil shale for easy separation from the dispersion,

(c) separating the released kerogen from the dispersion, and

(d) washing mineral matter from the separated kerogen with water.

4,545,892

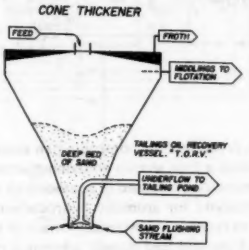
TREATMENT OF PRIMARY TAILINGS AND MIDDLINGS FROM THE HOT WATER EXTRACTION PROCESS FOR RECOVERING BITUMEN FROM TAR SAND

Lubomyr M. O. Cymbalisty, and George J. Cymerman, both of Edmonton, Canada, assignors to Alberta Energy Company Ltd., Calgary; Canadian Occidental Petroleum Ltd., Calgary; Esso Resources Canada Limited, Calgary; Gulf Canada Limited, Toronto; Her Majesty the Queen in right of Canada, as represented by the Minister of Energy and Natural Resources, Edmonton; HBOG-Oil Sands Limited, Calgary; Pan Canadian Petroleum Limited, Calgary and Petro-Canada Inc., Calgary, all of, Canada

Filed Apr. 15, 1985, Ser. No. 723,301

Int. Cl.⁴ C10G *1/00*

U.S. Cl. 208—11 LE **23 Claims**



1. A method for continuously recovering bitumen from a feed stream comprising water, sand, fines, and bitumen in a vessel having a conical lower end and which defines a processing chamber, comprising:

delivering said feed stream to be processed at the surface of the body of middlings already in the chamber;

substantially simultaneously contacting the newly added feed with a current of outwardly and generally horizontally moving aerated middlings;

whereby said newly added feed moves generally radially of the chamber in contact with the aerated middlings current, part of the bitumen contained in said newly added feed forms a froth layer at the surface of the body, bitumen-depleted feed forms a body of middlings in the chamber below the froth layer, and sand particles contained in said newly added feed settle downwardly;

concentrating the settling sand particles in the conical lower end of the vessel into the form of a dense solids bed, thereby separating the greatest part of the liquid phase from the solids phase;

recovering the greatest part of the froth from the vessel;

withdrawing an underflow tailings stream from the base of the vessel; and

withdrawing a middlings stream from the vessel mid-section.

4,545,893

ANTIFOULANTS FOR THERMAL CRACKING PROCESSES

Randall A. Porter, and Larry E. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 20, 1984, Ser. No. 632,934

Int. Cl.⁴ C10G *9/16, 9/12*

U.S. Cl. 208—48 R **17 Claims**

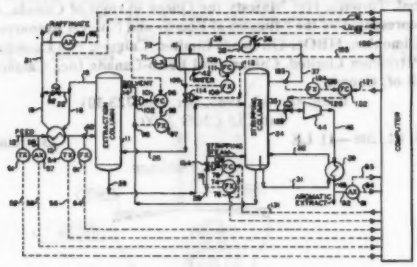
1. A method for reducing the formation of coke on the metals which are contacted with a gaseous stream containing hydrocarbons in a thermal cracking process comprising the step of contacting said metals with an antifoulant selected from the group consisting of a combination of tin and aluminum, a combination of aluminum and antimony and a combination of tin, antimony and aluminum.

4,545,894

CONTROL OF AN AROMATIC EXTRACTION

William S. Stewart, and John E. Blaesi, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 23, 1984, Ser. No. 633,768
Int. Cl.[4] C10G *21/30*
U.S. Cl. 208—311 **20 Claims**



11. A method for controlling an aromatic extraction process in which a feed stream containing aromatic and non-aromatic hydrocarbons is passed in contact with a solvent stream having a selectivity for aromatic hydrocarbons in an extraction column to remove a substantial portion of said aromatic hydrocarbons from said feed stream, wherein a raffinate stream containing most of the non-aromatic hydrocarbons contained in said feed stream is withdrawn from an upper portion of said extraction column, wherein a rich solvent stream containing most of the aromatic hydrocarbons contained in said feed stream is withdrawn from a lower portion of said extraction column and provided as a feed to a stripping column, wherein a recycle stream is withdrawn from an upper portion of said stripping column and provided to said extraction column, wherein an aromatic extract product stream is withdrawn from said stripping column, wherein stripping steam is passed in contact with said rich solvent stream in said stripping column to at least partially separate said aromatic hydrocarbons from said solvent and wherein said solvent stream passed in contact with said feed stream in said extraction column is withdrawn from a lower portion of said stripping column, said method comprising the steps of:

establishing a first signal representative of the flow rate of at least a portion of the aromatic hydrocarbons contained in said feed stream to said extraction column;

establishing a second signal representative of the concentration of at least a first non-aromatic component of said aromatic extract product stream;

establishing a third signal representative of the desired concentration of at least said first non-aromatic component of said aromatic extract product stream;

comparing said second signal and said third signal and establishing a fourth signal which is responsive to the difference between said second signal and said third signal, wherein said fourth signal is scaled so as to be representative of the ratio of the flow rate of said recycle stream from said stripping column to the flow rate represented by said first signal required to maintain the actual concentration of at least said first non-aromatic component in said aromatic extract product stream substantially equal to the desired concentration represented by said third signal;

multiplying said first signal by said fourth signal to establish a fifth signal which is representative of the flow rate of said recycle stream from said stripping column required to maintain the concentration of at least said first non-aromatic component in said aromatic extract product stream substantially equal to the desired concentration represented by said third signal; and

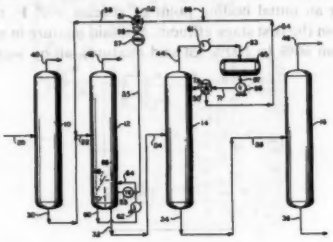
manipulating the flow rate of said recycle stream in response to said fifth signal.

4,545,895

FRACTIONAL DISTILLATION

Michael J. Brand, Edison, N.J., and Ricardo J. Callejas, Sweeney, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 29, 1984, Ser. No. 584,664
Int. Cl.[4] C10B *3/42*
U.S. Cl. 208—351 **20 Claims**



1. A fractionation process comprising:

(a) fractionating in a first fractionating column a first feed stream comprising low, medium and high boiling components; wherein said feed stream contains at least some components which are readily polymerizable at elevated temperature;

(b) recovering said low boiling component as a first overhead and as first kettle bottoms a fraction containing said medium and high boiling components;

(c) fractionating in a second fractionating column said first kettle bottom fraction containing said medium and high boiling components;

(d) recovering said medium boiling component as a second overhead and a fraction containing said high boiling component as second kettle bottoms; and

(e) returning at least a portion of the medium boiling component obtained as said second overhead in step (d) to the first feed stream employed in step (a); wherein step (e) is controlled in response to a temperature sensing means positioned at the bottom of said first column.

4,545,896

UPGRADING CONCENTRATES OF PARAMAGNETIC SULFIDE MINERALS

Subhaschandra G. Malghan, Cypress, Tex., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 26, 1984, Ser. No. 593,504
Int. Cl.[4] B03B *1/00*
U.S. Cl. 209—5 **6 Claims**

1. A process for upgrading low grade sulfide mineral concentrates selected from lead concentrates containing galena and pyrites, copper concentrates containing chalcopyrite and molybdenite, and copper concentrates containing galena and chalcopyrite by separating said concentrate into at least two fractions comprising:

obtaining a slurry of from 2 wt% to 50 wt% of said concentrate;

adding a dispersing agent to said concentrate in an amount ranging from about 1.0 to about 5.0 kg/t of mineral concentrate, said dispersing agent being selected from dispersing agents which when added to a sample slurry of particles maintain said particles substantially dispersed for about ½ hour; and

passing said slurry through said high gradient magnetic field at feed rates of about 30 to 150 mm/sec whereby the more magnetic pyrite or chalcopyrite material in said slurry is

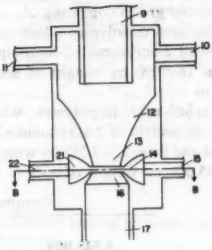
retained in said field and the less magnetic galena or molybdenite material in said slurry passes through thereby affecting a separation of said slurry into at least two fractions at least one of which is upgraded.

4,545,897

CLASSIFIER

Hiroaki Masuda, Hiroshimaken, Japan, assignor to Sankyo Dengyo Co., Ltd., Japan

Filed Aug. 9, 1983, Ser. No. 521,569
Claims priority, application Japan, Aug. 9, 1982, 57-138122
Int. Cl.⁴ B07B *7/04*
U.S. Cl. 209—135 **15 Claims**



1. A particle classifier, adapted for multi-phase gas flow, comprising

a nozzle substantially in the form of a narrowed throat, said throat being of substantially rectangular cross-section and through which a gas stream carrying particles to be classified is adapted to flow, said nozzle provided with an opening along one side of said substantially rectangular throat, finer particles exiting from the flowing stream through said opening,

means for introducing the particle gas stream into said nozzle and comprising a first conduit disposed upstream of said nozzle, and

means for introducing at least one other flowing gas stream into said nozzle and comprising a second conduit disposed upstream of said nozzle.

4,545,898

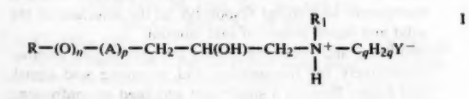
PROCESS FOR FROTH FLOTATION

Karl M. E. Hellsten, Ödsmål, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

Filed May 23, 1984, Ser. No. 613,652
Int. Cl.⁴ B03D *1/14*
U.S. Cl. 209—166 **11 Claims**

1. Process for froth flotation of phosphate ore, comprising carrying out the flotation in the presence of

(a) an amphoteric collector reagent having the general formula:



1

where

R is a hydrocarbon or acyl having from about seven to about twenty-four carbon atoms;

each A is oxyalkylene having from two to four carbon atoms;

R_1 is alkyl having from one to four carbon atoms or hydrogen;

Y is the COO^- or the group SO_3^-;

n is 0 or 1;

p is a number from 0 to 5; and

q is 1 or 2 and salts thereof and

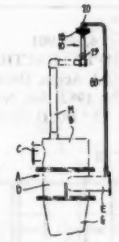
(b) a hydrophilic polysaccharide substituted with an anionic group or an ester thereof and having a viscosity not exceeding 5000 mNs/m^2 (cP) measured in a 1% water solution at 20° C. with a Brookfield Synchrolectric Viscosimeter Model LTV, spindle No. 3 at 3 rpm and recovering phosphate in the froth.

4,545,899

HYDROCYCLONES

Ivo R. Pincus, Victoria, Australia, assignor to Harrisons & Crosfield, Hawthorn, Australia

Filed Feb. 6, 1984, Ser. No. 577,344
Claims priority, application Australia, Aug. 12, 1983, PG0806
Int. Cl.⁴ B04C *11/00*
U.S. Cl. 209—211 **6 Claims**



1. In a hydrocyclone comprising a frusto conical feed box extension, a feed box attached to the larger end of the feed box extension, the feed box having a tangential feed pipe, an overflow box positioned over the feed box and including an overflow pipe and a vent pipe, and a fish tail at the narrower end of the feed box extension, the improvement wherein a pressure compensating valve is positioned in the vent pipe, said valve having a fluid actuator in fluid communication with said feed pipe for direct actuation of the valve by the pressure within the feed pipe.

4,545,900

SPIRAL SEPARATORS

Douglas C. Wright, Terranora, Australia, assignor to Mineral Deposits Ltd., Queensland, Australia

Filed Sep. 24, 1982, Ser. No. 422,657
Claims priority, application Australia, Oct. 9, 1981, PF1127
Int. Cl.⁴ B03B *5/52*
U.S. Cl. 209—459 **27 Claims**

1. A spiral separator having at least a portion comprising a helical trough supported with its axis upright and including a

plurality of turns for separating a pulp of water and minerals flowing theredown;

said helical trough when viewed in vertical cross section comprising an upwardly facing surface including a radially inner part and a radially outer part;

the inner part sloping generally downwardly from a radially inner end towards a radially outward direction;

the outer part sloping generally upwardly from a radially inner end thereof and in a radially outward direction and blending into an upright radially outer wall with a transition between said inner part and the inner end of said outer part;

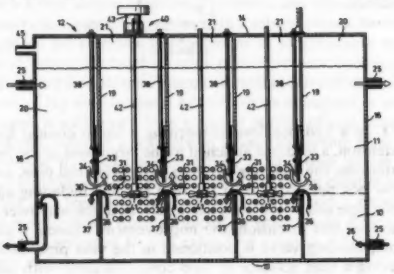
the outer end of the outer part of the trough working surface being closer to the axis, and the transition between said inner and outer parts of the working surface being further from the axis, at an initial portion of the trough than at a first portion downstream from the initial portion.

4,545,901

LIQUID-LIQUID EXTRACTION PROCESS

John C. Schneider, R.R. #2, Acton, Ontario, Canada L7J 2L8

Filed Oct. 24, 1983, Ser. No. 544,695
Int. Cl.[4] B01D *11/04*
U.S. Cl. 210—634 **12 Claims**



1. A process for continuously extracting a first liquid with a second liquid, the two liquids being capable of forming two separate phases defining a liquid-liquid interface, comprising:

continuously contacting the two liquids in an apparatus having a bottom, a top, two sides, two ends, means near each end for supplying and withdrawing liquid from the apparatus, and a plurality of partitions positioned within the apparatus defining a plurality of mixing chambers and a settling chamber at each end, at least one settling chamber having liquid exiting from the apparatus, each partition having at least one aperture through which liquid may flow from chamber to chamber, the mixing chambers being adjacent one another linearly and having means for agitating the liquids therein;

contacting the liquids initially in a settling chamber and then continuously flowing the liquids through the mixing chambers while continuously agitating the liquids in each mixing chamber to provide mixing thereof in a zone in the proximity of the liquid-liquid interface while maintaining substantial phase integrity beyond the agitation zone, said flow from chamber to chamber being carried out at the agitation zone;

continuously flowing the liquids through the mixing chambers at a rate sufficient to achieve the desired extraction efficiency;

continuously flowing the extracted liquids to a settling chamber for separation of the liquids; and

continuously removing at least one separated liquid from the settling chamber and the apparatus.

4,545,902

FLOCCULANTS FOR BAUXITE (RED MUD)

Lawrence J. Connelly, Oak Lawn, and Radhakrishnan Selvarajan, Oak Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sep. 17, 1984, Ser. No. 650,955
Int. Cl.[4] B01D *21/01*
U.S. Cl. 210—734 **3 Claims**

1. In a process of the type wherein water-soluble acrylic acid polymers are used to treat solutions of alumina and suspended red mud and the suspended red mud is flocculated and settled therefrom, the improvement which comprises using as the water-soluble acrylic acid polymer between 1–50 ppm based on the weight of the solutions of alumina of an acrylic acid copolymer or terpolymer having a molecular weight of at least 1,000,000 from the group consisting of:

(a) an acrylic acid copolymer which contains from 1–22% by weight of 2-acrylamido-2-methylpropanesulfonic acid and from 18–99% by weight of sodium or ammonium acrylate or

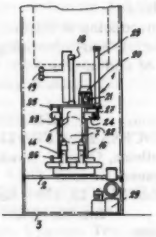
(b) an acrylic acid terpolymer which contains from 2.5–7.5% by weight of 2-acrylamido-2-methylpropanesulfonic acid and from 2.5–7.5% by weight of acrylamide and at least 85.0% by weight of sodium or ammonium acrylate.

4,545,903

APPARATUS FOR AUTOMATICALLY CONTROLLING THE SEDIMENTATION OF MUDS DURING THE PURIFICATION OF WASTE WATERS

Alfonso Visconti, Rome; Emilio Sernagiotto, and Raffaello M. Sernagiotto, both of Voghera, all of Italy, assignors to Officine Meccaniche Sernagiotto, Pavia, Italy

Filed Oct. 3, 1984, Ser. No. 657,336
Claims priority, application Italy, Oct. 6, 1983, 23173 A/83
Int. Cl.[4] C02C *1/26*
U.S. Cl. 210—96.1 **6 Claims**



1. An apparatus for automatically controlling the sedimentation of muds during purification of waste waters comprising:

a container for containing an amount of waste water under examination, said container being in a material which is transparent to a signal responsive to the interface of the solid and liquid phases of said amount;

transmitting and receiving means integral to one another respectively for transmitting and receiving said signal, said means forming a single unit arranged at confronting position diametrically opposite to the axis of said container;

means for the relative movement between said container and said unit controlled by the energization of said receiving means;

position sensing means as a time function of said unit relative to said container;

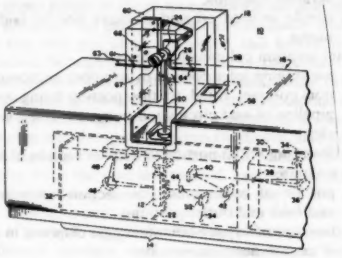
means for the automatic loading and unloading of said container; and

means for the internal washing of said container.

4,545,904
APPARATUS FOR REDUCING TAILING IN A LIQUID CHROMATOGRAPH

Abolghassem Y. Tehrani; John N. Jones, and Robert W. Allington, all of Lincoln,, Nebr., assignors to ISCO, Inc., Lincoln, Nebr.

Filed Mar. 1, 1984, Ser. No. 585,298
Int. Cl.[4] B01D *15/08*
U.S. Cl. 210—96.1 **14 Claims**



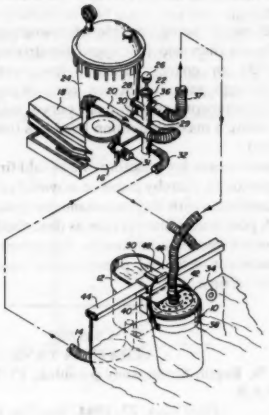
1. An apparatus comprising:
a chromatographic column having an inner diameter of no more than 2 millimeters;
said chromatographic column having a cylindrical externally threaded recessed portion in its outer wall at least at one end;
cylindrical tubular sleeve means having internal threads adapted to cooperate with the external threads on said column;
said sleeve means having an annular shoulder in its interior;
said annular shoulder being adapted to form a cylindrical opening less than 65 thousandths of an inch in diameter;
said cylindrical opening having a frit therein, whereby packing may be held against substantial thrust forces in the column;
the thickness of said frit being less than one hundred thousandths of an inch;
fastening means for fastening said sleeve to an inlet of a flow cell;
said inlet having a diameter less than two millimeters;
a light channel in said flow cell;
said inlet communicating with the light channel in the flow cell;
the fluid path between the end of said frit and said light channel being less than 15 millimeters; and
said light channel being at right angles to the central axis of said column.

4,545,905
FILTER BACKWASH WATER SAVER AND WATER FILTER TO CLEAN SWIMMING POOL FILTER

James T. Poe, Rt. 1, Box 119, Haw River, N.C. 27258

Filed May 30, 1984, Ser. No. 615,466
Int. Cl.[4] B01D *41/00, 45/00*
U.S. Cl. 210—136 **8 Claims**

1. A filter backwash water saver and water filter in combination with a swimming pool filter system having a main filter, a skimmer unit for receiving water from a swimming pool during a forward filtering cycle, a pump receiving the water from the skimmer unit, a multi-ported backwash flow valve for controlling a forward flow of water from the pump through the main filter during the forward filtering cycle and a reverse flow of water from the pump through the main filter during a backwash cycle, an outlet hose for discharging filter water during the forward filtering cycle through the backwash flow valve from the main filter to the pool and a backwash discharge outlet for discharging water during the backwash cycle, said filter backwash water saver and water filter comprising: a backwash filter unit comprising a hose coupling to input backwashed water, a filter medium to remove debris from the backwash water, and a filter housing insertable into the pool and containing the filter medium, a connecting hose from the backwash discharge outlet of the multi-ported backwash flow

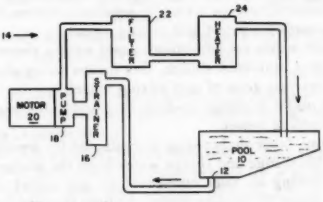


valve to hose the coupling of the backwash filter unit, and a control valve coupled between the skimmer unit and the backwash filter unit for permitting a flow of water from the swimming pool into the skimmer unit during the forward filtering cycle and permitting a flow of water from the backwash filter unit into the skimmer unit during the backwash cycle.

4,545,906
SWIMMING POOL FILTERING SYSTEM

Stanley H. Frederick, Ramsey, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 946,979, Sep. 29, 1978, Pat. No. 4,421,643, which is a continuation of Ser. No. 742,387, Nov. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 627,179, Oct. 30, 1975, abandoned. This application Aug. 2, 1983, Ser. No. 519,622
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.
Int. Cl.[4] E04H *3/20*
U.S. Cl. 210—138 **12 Claims**



1. A pool water filter system of the type wherein a closed water circulation path is provided having an inlet for receiving water from a pool and an outlet for discharging water into a pool at a point below the normal water level, said path including a centrifugal liquid pump and a filter between the inlet and outlet, said water circulation path having flow characteristics defining a system head curve that is variable depending upon the cleanliness of the filter when said water circulation path is primed with water, a motor is closely coupled to said pump for driving said pump at a first speed at which speed said pump is

capable of developing a maximum pump head H_{max} and a minimum pump head H_{min}, the actual pump head and water flow rate being determined by the instantaneous system head curve, said first speed sufficient to provide pump heads and water flow rates for priming said system, vacuuming and rapidly cleaning up after a storm, wherein the improvement comprises:

said motor being capable of operating at a second speed lower than said first speed for driving said pump to provide an energy efficient low water circulation rate through said circulation path in accordance with the instantaneous system head curve, said second speed providing a maximum pump head less than H_{max} minus H_{min}; and

switch means for selecting one of said first and second motor speeds to thereby achieve a water circulation rate in accordance with the instantaneous system head curve.

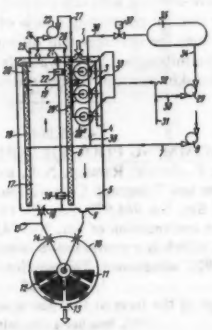
4. A pool water filter system as described in claim 1, wherein the switch means additionally comprises a timer means for automatically selecting preset motor speeds during selected periods of time.

4,545,907

AERATION TANK

Boris N. Repin, Stremyanny pereulok, 17/21, kv. 58, Moscow, U.S.S.R.

Filed Nov. 27, 1984, Ser. No. 675,300
Int. Cl.[4] C02F *3/20*
U.S. Cl. 210—195.1 **5 Claims**



1. An aeration tank comprising:

a mixing vessel having a starting zone and an end zone;

counterflow-type water-jet aeration columns disposed in the starting zone of said mixing vessel;

inlet means for admitting to said mixing vessel waste water and activated sludge, this means being disposed in the starting zone of said mixing vessel;

an outlet of sludge medium disposed in the end zone of said mixing vessel;

a thin-layer sludge separator adapted for separating recyclable sludge and sludge water from the sludge medium and having an inlet connected to said outlet of the mixing vessel for feeding sludge medium thereinto, and outlets of waste water and recyclable sludge;

dispersers of oxygen-containing gas disposed in said mixing vessel;

a chamber for regenerating sludge medium communicable with the outlet of recyclabe sludge of said sludge separator and with the end zone of said mixing vessel;

dispersers of oxygen-containing gas disposed in said regeneration chamber;

a chamber for deoxygenation of sludge medium communicable with said regeneration chamber and having an inlet for admitting waste water thereto and an outlet communicable with the starting zone of said mixing vessel;

dispersers of oxygen-containing gas disposed in said deoxygenation chamber;

a circulation pump;

a suction pipe of said circulation pump having two branches, one of the branches communicating with the starting zone of said mixing vessel, the other communicating with said chamber for deoxygenation of sludge medium;

a pressure line of said circulation pump connected to said aeration columns;

a nozzle secured on said pressure line of said circulation pump;

said aeration columns having each:

a converging inlet portion in an upper section of said aeration column, fitted to this portion being said pressure pipeline of said circulation pump provided with the nozzle;

a diverging outlet portion in a lower section of said aeration column;

a portion of continuous cross-section interposed between said inlet and outlet portions;

a disperser of oxygen-containing gas disposed in said portion of continuous cross-section;

ports provided in said outlet portion;

gas-trapping isolating casing secured on said pressure pipeline of said circulation pump so that its free end is immersed in sludge medium to isolate said inlet portion from the outside;

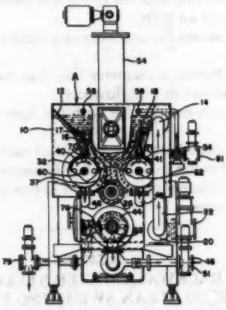
at least one source of oxygen-containing gas communicating with said dispersers of oxygen-containing gas.

4,545,908

LABEL DISPOSAL FILTER

Michael Vamvakas, 2739 Country Club Blvd., Rocky River, Ohio 44116

Continuation of Ser. No. 494,904, May 16, 1983, abandoned.
This application Nov. 1, 1984, Ser. No. 653,285
Int. Cl.[4] B01D *33/06, 35/16*
U.S. Cl. 210—256 **1 Claim**



1. A continuously operable apparatus for separation loose paper pieces from a solution of caustic soda comprising: a tank, an elongated solid plate hopper having an inlet and operatively disposed at the top of the tank interiorly thereof for receiving through the inlet a caustic solution mixed with paper pieces and having an elongated converged bottom opening defined in part by two spaced parallel bottom hopper edges positioned intermediate the top and bottom of the tank, perforated overhead flushing pipes disposed at the top of said hopper for cleaning the hopper, pump and manifold means for directing caustic solution mixed with paper pieces into said hopper, an elongated helical horizontal screw conveyor operatively disposed below and spaced from the hopper bottom opening in substantially parallel spaced relation thereto for feeding paper pieces to the tank exterior, a vertical screw conveyor operatively secured to the discharge of said elongated helical screw

conveyor for transportion the paper pieces in the form of a mash from the elongated helical screw conveyor up above the apparatus and onto an associated conveyor chute, a conveyor drive motor for driving the helical screw conveyor when desired, a pair of coacting elongated rotatable cylindrical perforated hollow drums spaced from each other to provide a space therebetween and operatively positioned in the hopper bottom opening above and substantially parallel to said helical screw conveyor for receiving from the hopper caustic solution mixed with paper pieces on the outer cylindrical surfaces of the drums and directing the paper pieces into the space between the drums and into the screw conveyor and for receiving caustic solution through the perforations in the drums and directing the solution to the bottom of the tank, a drum rotating motor for rotating the drums about their longitudinal axes, said drums each coactingly rotating in a direction to channel the paper pieces into the space between the drums, said drums having back-flushing means secured thereto to selectively flush out the drums from the interiors thereof, each of said drums having manifold piping secured to at least one of the ends thereof for feeding caustic solution from the drum interiors to the bottom of the tank, said drums having cylindrical peripheries of perforated stainless steel screens, said hopper having brushes secured to the bottom hopper edges and extending downwardly therefrom and operatively contacting said drum to clean the outer surfaces of the drums and forestall clogging of the drum perforations, an elongated hollow cylindrical screen-type filter having an outlet pipe and disposed at the bottom of the tank for final filtering of the caustic solution, a filter pump for directing the filtered solution from the outlet pipe to an associated storage container exteriorly of the tank, said cylindrical screen-type filter having a cylindrical periphery of perforated stainless steel screen, said cylindrical screen-type filter being covered with a nylon cloth to filter the caustic solution to 125 microns, said cylindrical screen-type filter having back-flushing means secured thereto for selectively flushing out the filter from the interior thereof, a brush secured to a bottom wall of the tank interiorly thereof and operatively contacting said filter to clean the exterior surface thereof, spray flushing pipes extending axially of each drum for flush cleaning the same, a tank drain outlet manifold secured to the bottom of said tank to drain the tank for cleaning purposes, and a pressurized liquid supply means communicating with each pipe, whereby a caustic soda solution mixed with paper pieces is fed by the pump and manifold means into the hopper and thence discharged by gravity onto the rotating drums which feed the paper pieces on the outer drum surfaces into the horizontal conveyor and thence to the exterior of the tank via the vertical conveyor and whereby the caustic soda solution flows through the perforations in the drums and thence to the bottom of the tank and through the cylindrical filter for final filtering and thence to an associated storage container exteriorly of the tank.

4,545,909

GROWTH OF BIOMASS

Bernard Atkinson, Copthorne; Geoffrey M. Black, Sale; Anthony Pinches, Offerton, and Paul J. S. Lewis, Abbotts Langley, all of England, assignors to The University of Manchester Institute of Science and Technology and Simon-Hartley Limited, both of Manchester, England

Continuation of Ser. No. 347,872, Feb. 11, 1982, Pat. No. 4,419,243, which is a continuation-in-part of Ser. No. 156,038, Jun. 3, 1980, abandoned, which is a division of Ser. No. 945,869, Sep. 26, 1978, abandoned. This application Dec. 2, 1983, Ser. No. 557,318

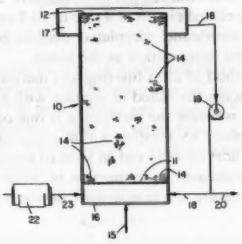
Claims priority, application United Kingdom, Oct. 20, 1977, 43613/77; Oct. 20, 1977, 43614/77; Oct. 20, 1977, 43615/77

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.[4] **C02F** *3/08*

U.S. Cl. 210—618 **4 Claims**

1. A process for promoting the growth of biomass from a supply of suitable nutrient material, comprising the steps of providing a vessel in which is contained a biomass support medium in the form of a plurality of movable bodies each having a substantially uniform reticular structure throughout the entire volume of the body, defining an internal voidage consisting of a multiplicity of interconnected pores such as to provide throughout the body a protective environment which will permit biomass growth in said pores and thus support and sustain active biomass as a substantially integral mass retained by said reticular structure, said protective environment thereby allowing each body to fill with biomass over a period of time, there being an extensive area of access by way of a multiplicity of openings defined by said reticular structure at



the external surface of each said body, to the whole of the voidage therein, the overall shape and reticular structure of each body being sufficiently plain as to enable the bodies to move relative to each other with a rubbing or knocking action without interlocking or packing together as a solid unit; causing the nutrient and any additional substances required for the process to flow through the vessel thus to contact and enter the bodies within the vessel; and causing relative movement of the bodies within the vessel during the growth process sufficiently for restricting accumulation of biomass outwardly from the outer surface of each said body and thus preventing overfill of biomass onto the external surface of each said body.

4,545,910

SEMI-PERMEABLE MEMBRANES

Xavier Marze, Lyons, France, assignor to Hospal Industrie, Lyons, France

Continuation of Ser. No. 10,548, Feb. 8, 1979, abandoned, which is a continuation of Ser. No. 872,911, Jan. 27, 1978, abandoned, which is a continuation of Ser. No. 492,217, Jul. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 178,400, Sep. 7, 1971, abandoned. This application Dec. 4, 1980, Ser. No. 212,829

Claims priority, application France, Sep. 9, 1970, 70 32762

Int. Cl.[4] **B01D** *31/00, 13/00*

U.S. Cl. 210—651 **49 Claims**

1. A semi-permeable membrane material for use in an apparatus adapted for dialysis and ultrafiltration of blood, having the following characteristics:

(a) high ultrafiltration properties indicated by a permeability to water in an aqueous macromolecular (of a molecular weight greater than 500) solution of from 230 to 8000 l/day m^2 at a relative pressure of 2 bars;

(b) a thickness of less than 100 microns and greater than 0.5 microns;

(c) a degree of rejection of salt as defined by

$$100 \times 1 - \frac{\text{NaCl concentration of a solution after permeation}}{\text{NaCl concentrarion of the solution subjected to permeation}}$$

of less than 1%;

(d) a degree of rejection of macromolecules defined by

$$100 \times 1 - \frac{\text{concentration of macromolecules of a solution after permeation}}{\text{concentration of macromolecules of the solution subjected to permeation}}$$

which is from 90% to 100% for cattle albumin of a molecular weight of 70,000, when an aqueous solution comprising 10 g/l of cattle albumin and 9 g/l of NaCl is subjected to a relative pressure of 2 bars;

(e) a high hemodialysis rate as represented by a reduction to a half the original concentration in 1.1 liters of human blood being reached after at most 1 hour 40 mn for urea and at most 2 hours 25 mn for creatinine, said blood circulated in a closed circuit at a rate of 12.5 cm3/mn over 625 cm2 of membrane, circulated dialysis bath having the same saline composition as the blood.

19. In a method of ultra-filtering and dialysing blood which comprises placing the blood in contact with a membrane, the improvement wherein the membrane is one of claim 1 which has been obtained by treating a film containing at least one copolymer of acrylonitrile and an ionic or ionisable olefinically unsaturated monomer by immersion in water or an aqueous non-solvent mixture at a temperature between 60° and 250° C.

4,545,911

POLYMERIC PYRROLIDINIUM METHANESULFONATE VISCOSIFIERS FOR AQUEOUS FLUIDS

Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

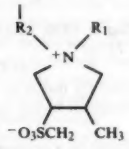
Division of Ser. No. 413,574, Aug. 31, 1982, Pat. No. 4,504,622, which is a continuation-in-part of Ser. No. 373,553, Apr. 30, 1982,. This application Jan. 28, 1985, Ser. No. 695,507

Int. Cl.[4] C09K *7/02;* **E21B** *43/22*

U.S. Cl. 252—8.5 A **21 Claims**

1. An aqueous fluid for use as either (a) a mobility control fluid in the secondary or tertiary recovery of oil or (b) a drilling fluid in the drilling of subterranean wells, said fluid having a salinity of at least 5 weight percent and comprising a salt of a polymeric sulfonate which comprises a polymeric polyvinyl alcohol backbone having side chain groups of the formula

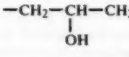
(I)



where:

(i) R_1 is CH_3, CH_2CH_3, CH_2CH_2OH, propyl, butyl or phenyl;

(ii) R_2 is $(CH_2)_n$ or



and

(iii) n is 1-5,

the salt being present in the fluid in an amount sufficient to thicken thhe fluid.

4,545,912

TWO-TAILED SURFACTANTS HAVING ONE AROMATIC CONTAINING TAIL AND THEIR USE IN CHEMICAL WATERFLOODING

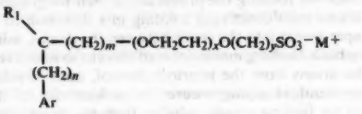
Kirk D. Schmitt, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 413,576, Aug. 31, 1982, Pat. No. 4,517,128. This application Mar. 5, 1984, Ser. No. 585,960

Int. Cl.[4] E21B *43/22*

U.S. Cl. 252—8.55 D **6 Claims**

1. A fluid for the secondary or tertiary recovery of oil from a subterranean oil reservoir comprising brine and a surfactant which is a compound of the formula



where:

(i) n and m are from 0 to 3;

(ii) y is from 0 to 5;

(iii) x is a rational number from 2 to 8;

(iv) R_1 is C_4-C_{10} alkyl;

(v) Ar is substituted or unsubstituted phenyl; and

(iv) M is a cation

wherein said surfactant is present at a concentration effective to enhance secondary or tertiary recovery of oil from a subterranean oil reservoir.

4,545,913

PLAIN BEARINGS

Duraid Mahrus, and Peter Bredemann, both of Sao Paulo, Brazil, assignors to Metal Leve S.A. Industria e Comercio, Brazil

Filed Sep. 23, 1983, Ser. No. 535,376

Int. Cl.[4] C10M *7/02*

U.S. Cl. 252—12.6 **9 Claims**

1. A plain bearing comprising:

a steel back;

an intermediate layer adjacent to said steel back;

a nickel layer adjacent to said intermediate layer; and

an antifriction layer adjacent to said nickel layer, said antifriction layer comprising a Pb-Sn-Cu alloy added with a charge of carbon fibers having diameters of less than 7 μm and lengths ranging from 0.025 mm to 2 mm, the alloy and the carbon fibers being electrodeposited simultaneously on the nickel layer.

4,545,914

CONDUCTIVE ELASTOMERS FROM ELECTRICALLY CONDUCTIVE FIBERS IN SILICONE EMULSION

Daniel Graiver, Midland, and Robert E. Kalinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 31, 1984, Ser. No. 645,986

Int. Cl.[4] H01B *1/06*

U.S. Cl. 252—511 **19 Claims**

1. A silicone composition which provides an elastomeric electrically conductive product upon removal of the water under ambient conditions comprising

(A) an emulsion of a dispersed phase of silicone elastomer, and a continuous phase of water containing a material selected from the group comprising colloidal silica, alkali metal silicates, and organosilicates, said emulsion being an aqueous oil-in-water emulsion, having at least 20 percent by weight water, that cures upon drying at ambient temperature to an elastomeric film, and

(B) from 10 to 25 parts by weight of electrically conductive particles in the form of fibers having a diameter of less than 25 micrometers and a length of less than 10 millime-

ters with the ratio of length to diameter of greater than 10:1, said particles being selected from the group consisting of graphite, stainless steel, and metal-coated graphite fibers where the metal coating is silver, gold, or nickel, based upon 100 parts by weight of non-volatile material in (A),

the composition yielding an elastic product, obtained by drying the composition at room temperature, comprising dispersed particles of elastomer and electrically conducting fibers in a solid polar continuous phase, and having a surface resistivity of less than 2 ohms per square on at least one surface.

4,545,915

LUBRICANTS CONTAINING POLYHYDROXY HYDROCARBYLAMINES

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 536,801, Sep. 28, 1983,. This application Aug. 21, 1984, Ser. No. 642,924

Int. Cl.⁴ C10M *1/32*

U.S. Cl. 252—515 R **17 Claims**

1. A lubricant composition comprising a major amount of a lubricant selected from the group consisting of (1) a mineral oil, (2) a synthetic oil, (3) a mixture of synthetic oils, (4) a mixture of a mineral oil and a synthetic oil and (5) a grease of (1), (2), (3) or (4) and an antifriction amount of a polyhydroxy hydrocarbylamine of the formula

$$(HO)_xRN(R^1)_2$$

wherein R is a C_2 to C_6 hydrocarbyl group, R^1 is hydrogen or a C_{10} to C_{30} hydrocarbyl group, at least one of R^1 being a hydrocarbyl group and x is 2 or 3.

4,545,916

HEAT STORAGE MATERIALS

Christine D. Chalk, Buckinghamshire, and Cecil Hayman, Hertfordshire, both of England, assignors to IC Gas International Limited, London, England

Filed Jul. 12, 1983, Ser. No. 513,097

Claims priority, application United Kingdom, Jul. 15, 1982, 8220589

Int. Cl.⁴ C09K *3/18, 5/06*

U.S. Cl. 252—70 **3 Claims**

1. A heat storage material which comprises sodium pyrophosphate decahydrate dispersed throughout an open cell polymeric matrix which is stable in an aqueous medium at 80° C., the polymeric matrix being present in a minor amount.

4,545,917

AUTOMATIC DISHWASHER PRODUCT IN SOLID FORM

James A. Smith, Old Tappan, and George W. Kellett, Jr., Cranford, both of N.J., assignors to Creative Products Resource Associates Ltd., Clifton, N.J.

Filed Feb. 9, 1984, Ser. No. 578,737

Int. Cl.⁴ A47L *15/44;* **C11D** *1/722, 3/37, 17/04*

U.S. Cl. 252—90 **13 Claims**

1. A solid composition of matter suitable for use as a cleansing or rinsing agent in an automatic dishwasher comprising

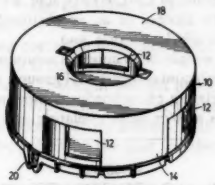
(a) from about 30–45%, by weight, of a polyethylene glycol or a blend of polyethylene glycols, said glycol or said blend thereof having a minimum molecular weight of about 4000;

(b) from about 15–25%, by weight, of a non-ionic solid, fatty acid alkanolamide having 10–24 carbon atoms in the fatty acid moiety;

(c) low foaming a non-ionic modified oxyethylated straight chain alcohol having 8–18 carbon atoms in the alcohol chain; and

(d) low-foaming a non-ionic ethylene diamine polyglycol condensate; components (c) and (d) being present in a combined concentration of 30–55%, by weight, with the weight ratio of (c) to (d) ranging from 3:1–1:3.

7. An automatic dishwasher product comprising, in combination, a dispenser having top, side and bottom surfaces with a plurality of openings therein and a solid, water soluble compo-



sition corresponding to claim 1 positioned therein, the area of said openings and the water solubility of said composition being selected so as to solubilize and release 0.5–2.0 grams of said composition when water at a temperature of from 40°–80° C. flows over the surface areas of said composition exposed through said openings.

4,545,918

STABILIZATION OF AQUEOUS SOLUTIONS CONTAINING HYDROGEN PEROXIDE, HYDROFLUORIC ACID AND METAL IONS

Christian Pralus, Saint-Cyr-Au-Mont-D'Or, France, assignor to Atochem, France

Filed Dec. 28, 1983, Ser. No. 566,479

Claims priority, application France, Jan. 7, 1983, 83 00210

Int. Cl.⁴ C11D *7/18, 7/08*

U.S. Cl. 252—142 **8 Claims**

4. A stabilized aqueous solution for the surface treatment of metals comprising hydrogen peroxide, metal ions and hydrofluoric acid which can be partially in the form of salts; all in an amount sufficient for said surface treatment, and a stabilizer comprising at least one hydroxide selected from an alkali metal hydroxide, ammonium hydroxide, or mixtures thereof in an amount which is insufficient to neutralize all the acidity present in said solution such that said hydrofluoric acid is at a concentration, expressed as total fluoride, of more than 38 grams per liter.

7. The process of treating the surface of metals to clean or chemically polish the same comprising applying thereto the solution of claim 4.

4,545,919

DETERGENT COMPOSITION FOR WASHING OFF DYEINGS OBTAINED WITH FIBRE-REACTIVE DYES AND WASHING PROCESS COMPRISING THE USE THEREOF

Heinz Abel, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 24, 1983, Ser. No. 525,842

Claims priority, application Switzerland, Aug. 31, 1982, 5175/82; Mar. 23, 1983, 1573/83

Int. Cl.⁴ C11D *1/44, 3/14, 7/02;* **D06L** *3/00*

U.S. Cl. 252—174.18 **21 Claims**

1. An aqueous detergent composition comprising

(A) 20 to 60% by weight of an alkali aluminum silicate,

(B) 0.5 to 20% by weight of an anionic alkylene oxide polyadduct of the formula

$$Y—O—(CH_2CH_2O)_m—X$$

wherein Y is alkyl or alkenyl, each of 8 to 22 carbon atoms, alkylphenyl containing 4 to 16 carbon atoms in the alkyl moiety, or o-phenylphenyl, m is 2 to 40, and X is the acid radical of an inorganic oxygen-containing acid, or is the

radical of an organic acid, said acid radical X being in the form of the free acid or its salt,

(C) 1 to 20% by weight of an aliphatic monoalcohol of 5 to 18 carbon atoms or a C_8–C_{22} fatty acid/alkanolamine reaction product or an adduct of said compounds with an alkylene oxide, or an adduct of C_8–C_{22} fatty acid, a trihydric to hexahydric aliphatic alcohol or an unsubstituted or substituted phenol with an alkylene oxide, and

(D) 2 to 30% by weight of an aqueous solution or dispersion of a polymer which contains carboxyl groups, in the substantial absence of chelating phosphorous compounds, electrolytes, ion exchangers and/or other chelating agents.

4,545,920

BOILER WATER TREATING COMPOSITIONS

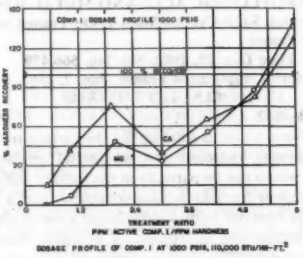
Walter F. Lorenc, Harvey; John A. Kelly, Woodridge, both of Ill., and Frederick S. Mandel, Baton Rouge, La., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 382,567, May 28, 1982, Pat. No. 4,457,847, which is a continuation-in-part of Ser. No. 318,665, Nov. 5, 1981, abandoned. This application Feb. 3, 1984, Ser. No. 576,643

The portion of the term of this patent subsequent to Jul. 3, 2001, has been disclaimed.

Int. Cl.[4] **C02F** *5/10*

U.S. Cl. 252—180 **4 Claims**


COMP. I DOSAGE PROFILE 1000 PSIG
100 % EFFICIENCY
% HARDNESS RECOVERY
TREATMENT RATIO
PPM ACTIVE COMP. I / PPM HARDNESS
DOSAGE PROFILE OF COMP. I AT 1000 PSIG, 110,000 BTU/HR-FT.²

1. A polymeric composition useful in treating boiler waters to prevent scale and to remove existing scale from heat transfer surfaces in contact with such boiler waters which comprises a combination of:

A. a water-soluble anionic vinyl polymer containing at least 70% by weight of a carboxylate functionality, a molecular weight within the range of 500–30,000, and a chelation value of at least 200; and

B. a second water-soluble anionic polymeric dispersant copolymer from the group consisting essentially of vinyl sulphonate-acrylic acid copolymers, and vinyl sulphonate-methacrylic acid copolymers, and having a molecular weight range of 750 to about 50,000, wherein the content of vinyl sulfonate is between 5–25 mole percent; with the ratio of A to B being within the range of 10:1 to 30:1.

4,545,921

LIQUID CRYSTALS HAVING A TYPE A SMECTIC PHASE

Jean-Claude Dubois, St. Remy les Chevreuses; Gilles Ravaux, Les Ulis, and Pierre Le Barny, Igny, all of France, assignors to Thomson-CSF, Paris, France

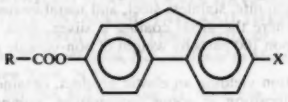
Filed Dec. 29, 1983, Ser. No. 566,734

Claims priority, application France, Dec. 30, 1982, 82 22074

Int. Cl.[4] **C09K** *3/34;* **C07C** *121/64, 69/62*

U.S. Cl. 252—299.62 **14 Claims**

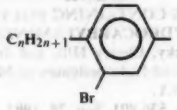
1. An organic compound of the substituted fluorene ester type, having at least one smectic A mesomorphous phase, in accordance with the general formula:



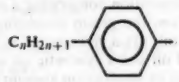
for which R is:

C_nH_{2n+1}-with N being 7 through 15 and X=Br

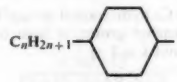
C_nH_{2n+1}-with N being 9 through 15 and X=CN



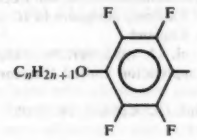
with N being 1 through 15 and X=Br or CN



with N being 1 through 15 and X=Br or CN



with N being 1 through 15 X=Br or CN



with N being 1 through 15 and X=Br or CN.

4,545,922

LIQUID CRYSTALLINE FLUORINE-CONTAINING CYCLOHEXYLBIPHENYLS AND DIELECTRICS AND ELECTRO-OPTICAL DISPLAY ELEMENTS BASED THEREON

Rudolf Eidenschink, Dieburg, and Ludwig Pohl, Darmstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

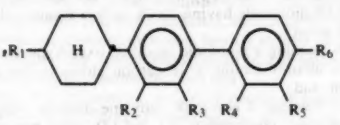
Continuation-in-part of Ser. No. 320,146, Nov. 10, 1981, Pat. No. 4,415,470. This application Sep. 21, 1983, Ser. No. 534,511

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1980, 3042391

Int. Cl.[4] **G02F** *1/13;* **C09K** *3/34;* **C07C** *121/64, 25/18, 43/225*

U.S. Cl. 252—299.63 **11 Claims**

1. A Cyclohexylbiphenyl of the formula



wherein R^1 is alkyl of 1–12 C atoms; R_6 is alkyl or alkoxy each of 1–12 C atoms or fluorine; R_2, and R_3, each is hydrogen or fluorine, and R_4 and R_5 each is hydrogen with the proviso that at least one of R_2 and R_3 is fluorine.

4,545,923

PROCESS FOR PREPARING COLLOIDAL CERIC OXIDE AND COMPLEXES THEREOF WITH FREE ORGANIC ACIDS

Peter S. Gradeff, Pottersville; Vincent J. Charte, East Windsor; Fred G. Schreiber, Highland Park, and John F. Davison, Edison, all of N.J., assignors to Rhone-Poulenc Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 387,401, Jun. 11, 1982, abandoned. This application Jan. 24, 1983, Ser. No. 460,694

Int. Cl.⁴ B01J *13/00;* **C07C** *143/24;* **C11C** *1/00*

U.S. Cl. 252—309 **25 Claims**

1. A process for preparing colloidal dispersions of ceric dioxide in inert organic liquids which comprises

(1) heating

(a) ceric dioxide containing ammonium nitrate in an amount within the range from about 3 to about 14% by weight of the ceric dioxide and a member selected from the group consisting of water; methanol; acetic acid; and mixtures thereof in an amount of at least 10 g per mole of CeO_2 sufficient to effect reaction with

(b) an organic acid having from about ten to about forty carbon atoms; and

(c) an organic liquid selected from the group consisting of aliphatic and aromatic hydrocarbons; aliphatic and cycloaliphatic ethers; and aliphatic and cycloaliphatic ketones at a temperature within the range from about 60° to about 200° C., thereby forming a colloidal dispersion in the organic liquid of the ceric dioxide and associated organic acid; and

(2) removing any water, methanol and acetic acid released durig the heating and separating any undissolved solid particles.

4,545,924

PRODUCTION OF A MAGNESIUM CHLORIDE GEL SYSTEM USEFUL IN CERAMICS AND FIBER PRODUCTION

George W. Ritter, II, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 13, 1983, Ser. No. 503,948

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ B01J *13/00;* **B28B** *7/28, 7/32;* **C07G** *1/00*

U.S. Cl. 252—315.7 **5 Claims**

1. A method of preparing a magnesium and aluminum-containing gel suitable for forming fibers comprising:

(a) forming an aqueous gel by mixing an aqueous solution of magnesium chloride hexahydrate and an aluminum chlorohydrate-propylene glycol complex in contact with hydrochloric acid, said magnesium chloride hexahydrate being present in an amount of from 35 to 100 parts by weight per 675 parts by weight of water, said aluminum chlorohydrate-propylene glycol complex being present in an amount within the range of from about 62 to about 65 parts by weight of said aqueous gel, and the hydrogen chloride in said hydrochloric acid being present in an amount of from about 1.29 to about 4.48 parts by weight per said 675 parts by weight of water;

(b) removing water from said aqueous gel under reduced pressure; and

(c) storing the gel from step (b) at 25° C. to 40° C. for up to about fourteen days to obtain a gel having a viscosity of about 150 poise at 50° C.

4,545,925

CORROSION INHIBITED FREEZE PROTECTED HEAT TRANSFER FLUID

Sidney F. Bosen, Joliet, and Bruce D. Perlson, Morris, both of Ill., assignors to Norchem, Inc., Omaha, Nebr.

Filed May 7, 1984, Ser. No. 607,800

Int. Cl.⁴ C23F *11/00*

U.S. Cl. 252—389 A **4 Claims**

1. An improved corrosion inhibited, freeze protected, heat transfer fluid which is comprised of:

a. At least about 0.25 weight percent phosphate,

b. Greater than 0.025 weight percent nitrite, and

c. The balance a polyhydroxy alcohol; with the proviso that nitrate not be present in the heat transfer fluid.

4,545,926

CONDUCTIVE POLYMER COMPOSITIONS AND DEVICES

Robert W. Fouts, Jr., Redwood City; Andrew N. S. Au, Fremont; Burton E. Miller, Sunnyvale, and Alan J. Gotcher, Saratoga, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Apr. 21, 1980, Ser. No. 141,991

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—511 **49 Claims**

1. A conductive polymer composition which exhibits PTC behavior with a switching temperature T_s and which comprises:

(1) an organic polymeric material which comprises a crystalline, thermoplastic polymer, and

(2) dispersed in said polymeric material a filler component which comprises

(a) at least about 10% by volume, based on the total volume of the composition of a first conductive particulate filler which has a first particle size D_1 from 0.01 to 200 microns and which consists of a metal having a resistivity at 25° C. of less than 10^{-3} ohm. cm; and

(b) at least 4% by volume, based on the total volume of the composition, of a second particulate filler which has a second average particle size D_2 from 0.001 to 50 microns and which is composed of non-metallic material;

said composition having a resistivity at 25° C., ρ_{25}, of less than 10^5 ohm-cm and a resistivity at a temperature in the range T_s to (T_s+100)°C. which is at least $1000\times\rho_{25}$.

4,545,927

CONDUCTIVE (HARD) RUBBER COMPOSITIONS

Henry E. Railsback, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 29, 1982, Ser. No. 403,211

Int. Cl.⁴ H01B *1/06*

U.S. Cl. 252—511 **18 Claims**

1. A process for preparing a conductive rubber compound exhibiting an electrical resistivity of less than about 10^6 Ohm cm, which comprises:

(A) blending (a) a dispersing component which is a thermoplastic polymer, and a conducting amount of (b) at least one conductor selected from the group consisting of (b-1) conductive carbon blacks, (b-2) metal powders or metal particles, and (b-3) mixtures, thereby preparing a Masterbatch (A), wherein said Masterbatch (A) contains in the range of about 10 to 80 weight (b), and

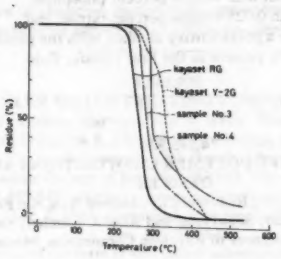
(B) blending said Masterbatch (A) with (c) at least one elastomer in a proportion effective to provide low resistivity to said elastomer, wherein said effective proportion is about 1.1:1 to 5:1 Masterbatch (A):(c),

thereby preparing said conductive rubber compound.

4,545,928
PASTE FOR FORMING A TRANSPARENT, ELECTRICALLY CONDUCTIVE FILM

Mitsuru Kano, and Yoshimi Kamijo, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 471,184, Mar. 1, 1983, abandoned. This application Apr. 25, 1984, Ser. No. 603,609
Claims priority, application Japan, Mar. 1, 1982, 57-30516
Int. Cl.⁴ H01B *1/06*
U.S. Cl. 252—518 **7 Claims**



1. In a paste for forming transparent, electrically conductive films comprising an organometallic compound that forms a transparent metal oxide upon calcination, an organic solvent and a thickening agent; the improvement comprising blending in said paste a lower alkyl group substituted monoazo type compound having the following properties,

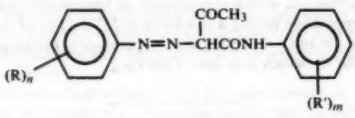
a. solubility in the selected solvent is less than 0.2% by weight,

b. starts to burn at a temperature below 300° C. and leaves little or no residue at 500° C.,

c. is chemically inert towards the thickening agent, solvent and organometallic compound,

d. is essentially free of alkali ions or metal components,

e. is a fine powder comprised of particles with an average particles diameter less than 1 μm; and represented by the formula:



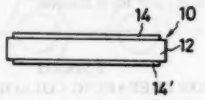
wherein R and R' are lower alkyl containing up to six carbon atoms and n and m are positive integers the total of which is 4 or 5.

4,545,929
CERAMIC MATERIALS WITH A VOLTAGE-DEPENDENT NONLINEAR RESISTANCE

Masaru Masuyama, Harunamachi; Susumu Hirooka, Takasaki, and Nobutatsu Yamaoka, Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1982, Ser. No. 398,193
Claims priority, application Japan, Jul. 22, 1981, 56-114877; Feb. 8, 1982, 57-18496
Int. Cl.⁴ H01B *1/06*
U.S. Cl. 252—520 **2 Claims**

1. A ceramic material with a voltage-dependent nonlinear resistance, comprising 100 mole parts of $SrTiO_3$, from about 0.01 to about 3.00 mole parts of at least one metal oxide selected from the group consisting of Nb_2O_5, Ta_2O_5, WO_3,



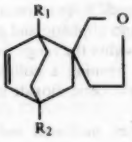
La_2O_3, CeO_2, Nd_2O_3, Y_2O_3, Sm_2O_3, Pr_6O_{11}, Eu_2O_3, and Dy_2O_3, and from about 0.02 to about 2.50 mole parts of Na_2O.

4,545,930
TERPENE DERIVATIVES AND PERFUME COMPOSITIONS CONTAINING THEM

Horst Upadek, Erkrath, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 323,430, Nov. 20, 1981, Pat. No. 4,351,772. This application Jul. 15, 1982, Ser. No. 398,555
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046068
Int. Cl.⁴ C11B *9/00*
U.S. Cl. 252—522 R **6 Claims**

1. A perfume composition comprising an effective odorant amount of a mixture of isomers of the formula



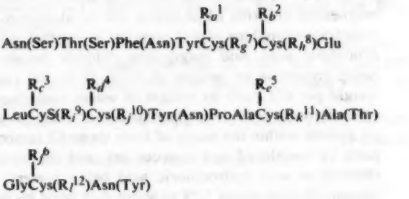
wherein R_1 and R_2, which are different from each other, are each methyl or isopropyl, the remainder comprising customary constituents of perfume compositions.

4,545,931
SYNTHETIC HEAT-STABLE ENTEROTOXIN POLYPEPTIDE OF *ESCHERICHIA COLI*

Richard A. Houghten, Solana Beach, Calif., assignor to Scripps Clinic and Research Foundation, La Jolla, Calif.

Filed Jan. 3, 1983, Ser. No. 455,265
Int. Cl.⁴ C07C *103/52*
U.S. Cl. 260—112.5 R **12 Claims**

1. A synthetic polypeptide, taken from left to right and in the direction from amino-terminus to carboxy-terminus, represented by the formula:



wherein

R_a^1, R_b^2, R_c^3, R_d^4, R_e^5 and R_f^6 are the same or different moieties bonded to the sulfur atom of the Cys respective residue;

a–f are integers having a value of zero or one with the provisos that:

(I) "e" is zero when "a" is zero, "d" is zero when "b" is zero, and "f" is zero when "c" is zero;

(II) at least one of "a", "b" or "c" is zero whereby the corresponding $R_{a-c}{}^{1-3}$ is absent as is the $R_{d-f}{}^{4-6}$ whose subscript is zero when said "a", "b" or "c" is zero and an intramolecular disulfide bond is present between the respective Cys residues of said formula for which a subscript value of zero under proviso (I) requires another subscript value to be zero; and

(III) when a value of a–f is one, said respective $R_{a-f}{}^{1-6}$ groups taken individually are selected from group consisting of hydrogen, an alkyl group containing 1 to about 4 carbon atoms, and a substituted alkyl group containing 2 to about 20 carbon atoms;

$R_g{}^7$, $R_k{}^8$, $R_i{}^9$, $R_j{}^{10}$, $R_k{}^{11}$ and $R_l{}^{12}$ are alternative Ser residues to the immediately preceding Cys residue shown in said formula;

g–l are integers having the value of zero or one whereby when the value of any g–l is zero the corresponding $R_{g-l}{}^{7-12}$-group is absent with the proviso that:

(IV) each of "g" and "k" is zero when "a" is zero, each of "h" and "j" is zero when "b" is zero, and each of "i" and "l" is zero when "c" is zero; and when the value of any of g–l is one, said corresponding $R_{g-l}{}^{7-12}$-groups are present;

said synthetic polypeptide having at least about 10% of the antigenicity of that of biologic heat stable enterotoxin of *Escherichia coli* and having thin layer chromatographic and electrophoretic mobilities different from said biologic heat stable enterotoxin.

4,545,932

GLUCOSAMINYL MURAMYL PEPTIDE DERIVATIVES

Yoshiyuki Takase, Amagasaki; Ryuji Furuta, Otsu; Shigeo Kawata, Kobe; Shunsuke Naruto, Ikoma; Shinichi Nakamura, Takatsuki, and Akira Minami, Hirakata, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan

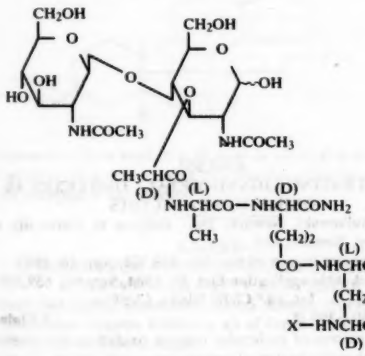
Filed May 13, 1983, Ser. No. 494,336

Claims priority, application Japan, May 14, 1982, 57-82178

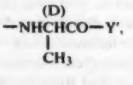
Int. Cl.⁴ C07C *103/52*

U.S. Cl. 260—112.5 R **14 Claims**

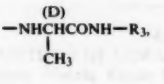
1. A compound of the formula:



wherein X is hydrogen or a group of the formula: R_1CO—, Y is hydroxy or a group of the formula: —OR_2, —NH—R_3 or



R_1 is C_{1-30} alkyl or C_{2-30} alkenyl, R_2 is C_{1-4} alkyl or benzyl, R_3 is hydrogen or C_{1-30} alkyl, Y' is hydroxy or a group of the formula: —OR_2 or —NH—R_3, (D) and (L) mean the configuration, provided that when X is hydrogen, Y is a group of the formula: —NH—R_3, or



wherein R_3' is C_{1-30} alkyl, or a pharmaceutically acceptable salt thereof.

4,545,933

HYDROLYZED PROTEIN COMPOSITION AND PROCESS USED IN PREPARATION THEREOF

John H. Ernster, 5658 Ravenspur, Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 404,049, Aug. 2, 1982, which is a continuation-in-part of Ser. No. 179,771, Aug. 20, 1980, Pat. No. 4,363,820. This application Aug. 23, 1984, Ser. No. 644,022

Int. Cl.⁴ A23J *1/20*

U.S. Cl. 260—119 **24 Claims**

1. An exothermic process performed in the absence of an addition of heat for preparing a hydrolyzed protein from casein and wherein said hydrolyzed protein is not sodium or potassium caseinate which comprises:

locating a quantity of acid precipitated casein as a solid in a reaction vessel;

locating a quantity of a compound chosen from the group consisting of sodium hydroxide and potassium hydroxide in said reaction vessel;

locating a quantity of water of at least 10% by weight of the total contents of the reaction vessel in said reaction vessel, said quantity of water insufficient to solubilize said casein such that said casein is present in said reaction vessel as a solid;

stirring the solid contents of said reaction vessel for at least 2 minutes so as to initiate the release of an ammoniacal odor from said solid contents of said reaction vessel;

discharging said contents of said reaction vessel as a solid by removing said solid contents from said reaction vessel.

4,545,934

PROCESS FOR THE PRODUCTON OF 4-SUBSTITUTED ACETOACETIC ACID DERIVATIVES

Felix Previdoli, Ried bei Brig, and Leander Tenud, Visp, both of Switzerland, assignors to Lonza Ltd., Basel, Switzerland

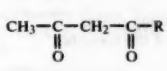
Filed Mar. 21, 1984, Ser. No. 591,926

Claims priority, application Switzerland, May 26, 1983, 2878/83

Int. Cl.⁴ C07C *45/00*

U.S. Cl. 260—239 E **12 Claims**

1. Process for the production of a 4-substituted acetoacetic acid derivative from a corresponding acetoacetic acid derivative, which comprises: treating an acetoacetic acid derivative having the formula:



wherein R is an alkoxy having 1 to 6C atoms, phenoxy, —NR'_2, wherein R' is alkyl having 1 to 6C atoms or aryl, or —NR'_2, which is azetidine, pyrrolidine or piperidine, with a secondary amine at an elevated temperature and in the presence of an organic solvent, with the water formed being separated, converting the intermediate product of the preceeding step into the corresponding 3-enamine carboxylic acid derivative, converting the 3-enamine carboxylic acid derivative by treatment with sodium amide in liquid ammonia into the corresponding sodium salt, converting the sodium salt by treatment with a halogen compound having the formula R_1CH_2X or R_1R_2CHX, wherein R_1 and R_2 each is alkyl, alkenyl, alkinyl or

aryl and X is chlorine, bromine or iodide, into the corresponding 4-substituted enamino derivative, and hydroyzing the 4-substituted enamino derivative into the 4-substituted acetoacetic acid derivative.

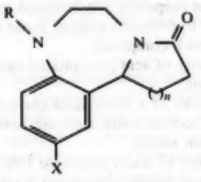
4,545,935

AMIDOALKYLATION REACTIONS OF ANILINES

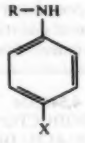
George A. Kraus, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Sep. 12, 1983, Ser. No. 531,213
Int. Cl.[4] A61K *31/55*; C07D *471/04*, *487/04*
U.S. Cl. 260—245.7 10 Claims

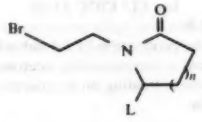
1. A process of preparing Benzodiazepines of the formula:



wherein "R" and "X" are as hereinafter defined and "n" is a whole integer and is 1, 2 or 3, by a direct single step synthesis reaction of an N-alkylaniline of the formula:

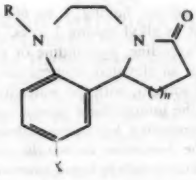


wherein "R" equals C_1 to C_{12} alkyl group, and X equals hydrogen, Cl, or alkoxy, with an alkoxy lactam of the formula:



wherein "L" is a leaving group.

10. A compound of the formula:



wherein "R" is a C_1 to C_{12} alkyl group, "X" is hydrogen, chloro or alkoxy, and n is 1, 2 or 3.

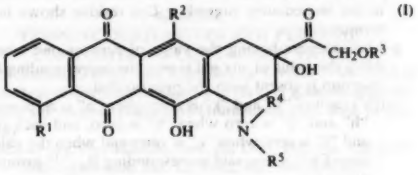
4,545,936

NOVEL AMINONAPHTHACENE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Kikuo Ishizumi, Toyonaka; Michihisa Muramatsu, Osaka; Hiromi Sato, Toyonaka; Norihiko Tanno, Ibaraki, and Noboru Yoshida, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

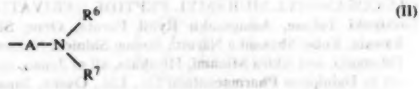
Continuation-in-part of Ser. No. 490,759, May 2, 1983, abandoned. This application May 4, 1984, Ser. No. 607,268
Claims priority, application Japan, May 7, 1982, 57-76835
Int. Cl.[4] C07C *15/24*, *50/22*, *50/36*
U.S. Cl. 260—377 4 Claims

1. An aminonaphthacene derivative of the formula:



(I)

wherein R^1 is a hydrogen atom, a hydroxyl group or a lower alkoxy group, R^2 is a hydrogen atom or a hydroxyl group, R^3 is a hydrogen atom or a lower alkanoyl group and R^4 and R^5 are, same or different, each a hydrogen atom, a lower alkyl group, a lower hydroxyalkyl group or a group of the formula:



(II)

wherein A is an alkylene group which may have one or more lower alkyl substituent(s) and R^6 and R^7 are, same or different, each a hydrogen atom, a lower alkyl group, a lower hydroxyalkyl group or a lower aminoalkyl group, and an acid addition salt thereof.

4,545,937

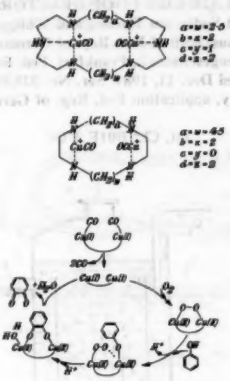
BINUCLEATING LIGAND-METAL COMPLEXES AS OXIDATION CATALYSTS

John E. Bulkowski, Newark, Del., assignor to University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 485,764, Apr. 18, 1983, abandoned. This application Oct. 10, 1984, Ser. No. 659,396
Int. Cl.[4] C07C *50/00*, *37/58*
U.S. Cl. 260—396 R 8 Claims

1. The process of molecular oxygen oxidation of a phenol having a phenolic hydroxyl group, at a position ortho to said phenolic hydroxyl group to produce product selected from the group consisting of o-quinones and catechols, said process being carried out in the presence of oxygen and an amount of catalyst effective to catalyze said oxidation, said catalyst having two proximate cations of Cu(I), each cation coordinated within a chelating center derived from ethylenediamine, diethylenetriamine, propylenediamine, or dipropylenetriamine, said centers being joined by two bridges selected from the group consisting of $—CH_2CH_2OCH_2CH_2—$ and alkylene radicals containing 2 to 5 carbon atoms in the main chain, said bridges connecting terminal nitrogen atoms of said amines whereby to

form a macrocycle ligand having said chelating centers, with the proviso that when at least one of the chelating centers is



derived from ethylenediamine, alkylene radicals, contain at least 4 carbon atoms in the main chain.

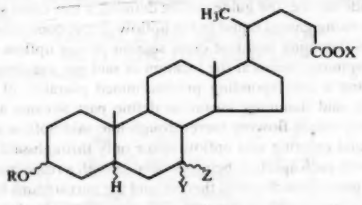
4,545,938

CHEMICAL SYNTHESIS

Erwin H. Mosbach; Misuho Une, and Charles K. McSherry, all of New York, N.Y., assignors to Beth Israel Medical Center, New York, N.Y.

Filed Nov. 2, 1983, Ser. No. 548,078
Int. Cl.⁴ C07J *9/00*
U.S. Cl. 260—397.1 **10 Claims**

1. A compound of the formula,



wherein R is H or acyl; X is H, acyl or alkyl; Z is H, hydroxy or acyloxy; Y is lower alkyl; and the non-toxic pharmaceutically acceptable salt thereof.

4,545,939

PROCESS FOR PRODUCING SULFONATE OF UNSATURATED FATTY ACID ESTER

Shizuo Sekiguchi, Funabashi; Kyozo Kitano, Narashino, and Katsumasa Nagano, Ichikawa, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 626,081
Claims priority, application Japan, Jul. 1, 1983, 58-119776; Dec. 27, 1983, 58-249689
Int. Cl.⁴ C07C *143/90*
U.S. Cl. 260—400 **7 Claims**

1. A process for producing a sulfonate of an unsaturated fatty acid lower alkyl ester comprising the steps of:

(i) sulfonating a mixture of (A) a lower alkyl ester of an unsaturated C_8 to C_{22} fatty acid and (B) a lower alkyl ester of a saturated C_8 to C_{22} fatty acid in a weight ratio of (A)/(B)=90/10 to 5/95 with a sulfonating agent in such a manner that the amount of the unreacted component (A) in the total unreacted components in the mixture is at least 0.3% by weight; and

(ii) neutralizing and hydrolyzing the sulfonated product.

4,545,940

METHOD OF DEWAXING A VEGETABLE OIL

Yoshihiko Mutoh; Kazuo Matsuda; Masashi Ohshima, and Hiroo Ohuchi, all of Yokohama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 31, 1983, Ser. No. 480,819
Claims priority, application Japan, Apr. 9, 1982, 57-58255
Int. Cl.⁴ C09F *5/10*
U.S. Cl. 260—428 **9 Claims**

1. A method of dewaxing a vegetable oil which comprises:

adjusting the temperature of a vegetable oil containing a wax to a temperature of about −10° C. to about 20° C. to allow the wax to crystallize; and

subjecting the temperature-adjusted vegetable oil to filtration by means of a porous membrane having pores which form passages running through the membrane from one surface thereof to the other surface thereof,

said porous membrane having at its surface a critical surface tension (γc) of less than 33 dynes/cm and having an average pore diameter of 0.05 to 5 μm,

thereby selectively permeating the vegetable oil through the membrane while separating the crystallized wax from the vegetable oil.

4,545,941

CO-METATHESIS OF TRIGLYCERIDES AND ETHYLENE

Dale W. Rosenburg, Maryville, Mo., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jun. 20, 1983, Ser. No. 505,616
Int. Cl.⁴ C11C *3/02*
U.S. Cl. 260—410.7 **24 Claims**

1. A process for modifying triglycerides and for producing alpha-olefins which comprises reacting triglycerides having fatty acid esters containing isolated carbon-carbon double bonds with ethylene at an ethylene partial pressure of about 330 to 490 psig in the presence of a catalytically effective amount of a metathesis catalyst at a temperature of about 100° F. to 500° F. for a period of time sufficient to convert the fatty acid esters into reduced chain length fatty acid esters containing isolated and terminal carbon-carbon double bonds and to form alpha-olefins.

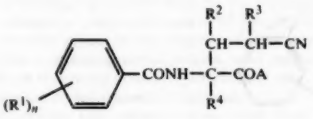
4,545,942

AMINO-ACID DERIVATIVES, THEIR PREPARATION AND THEIR USE AS PHARMACEUTICALS

Mitsuo Nagano; Koichi Hirai; Kouichi Kitamura; Kenkichi Shinkai, and Hiroshi Yasuda, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation of Ser. No. 244,802, Mar. 17, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 597,817
Claims priority, application Japan, Mar. 22, 1980, 55-36562
Int. Cl.⁴ C07C *121/78;* A61K *31/275*
U.S. Cl. 260—465 D **16 Claims**

1. Compounds having the formula



wherein

R^1 is a halogen atom;

R^2 and R^3 are both hydrogen atoms;

R^4 is an alkyl group having from 1 to 4 carbon atoms;

A is a hydroxy group or an alkoxy group having from 1 to 4 carbon atoms; and

n is 1;

and, when A is the hydroxy group, the pharmaceutically acceptable carboxylic acid salts thereof.

4,545,943

FLUIDIZED BED PROCESS FOR PRODUCING ACRYLONITRILE AND CATALYTIC MIXTURE CONTAINING ANTIMONY OXIDE-SILICA COMPOSITE USED THEREIN

Robert A. Innes, and Harold E. Swift, both of Monroeville, Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Mar. 4, 1981, Ser. No. 240,267

Int. Cl.⁴ C07C *120/14*

U.S. Cl. 260—465.3 **19 Claims**

1. A process for preparing acrylonitrile which comprises passing propylene, oxygen and ammonia at an elevated temperature upwardly through a fluidized bed reactor, wherein said bed comprises an admixture of (A) particles of a highly-active acrylonitrile catalyst, said highly-active catalyst being capable of producing acrylonitrile in the presence of propylene, molecular oxygen and ammonia at the rate of at least 0.1 gram of acrylonitrile per gram of catalyst per hour, and (B) particles of a composite consisting essentially of antimony oxide and silica in a weight ratio of antimony oxide to silica of from about 1:3 to about 3:1, the weight ratio of said antimony oxide-silica composite to said highly-active catalyst being in the range of between about 0.5:1 to about 20:1.

4,545,944

HERBICIDALLY ACTIVE NOVEL SUBSTITUTED PHENYLSULFONYLUREA DERIVATIVES AND INTERMEDIATES THEREFOR

Masahiro Aya; Junichi Saito; Kazuomi Yasui, all of Tokyo; Kozo Shiokawa, Kanagawa; Norihisa Morishima, Tokyo, and Toshio Goto, Kanagawa, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

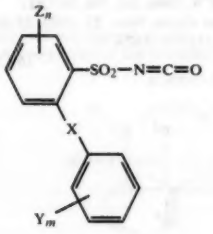
Division of Ser. No. 415,629, Sep. 7, 1982, Pat. No. 4,474,600. This application Dec. 14, 1983, Ser. No. 561,610

Claims priority, application Japan, Sep. 16, 1981, 56-144590

Int. Cl.⁴ A01N *9/22*; C07D *251/16*; C07C *153/00*

U.S. Cl. 260—545 R **3 Claims**

1. A substituted benzenesulfonyl isocyanate of the formula



wherein

X is an oxygen atom,

Y and Z each is a halogen atom or a nitro group,

m and n each independently is 0, 1 or 2, and m+n=1.

4,545,945

PROCESS FOR IMPROVING THE GAS DISTRIBUTION IN AIR-LIFT LOOP REACTORS

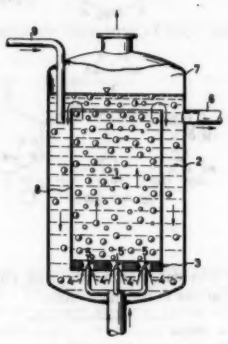
Paul Präve, Bad Soden am Taunus, and Wolfgang Sittig, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,886

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047101

Int. Cl.⁴ B01F *3/04*

U.S. Cl. 261—36 R **6 Claims**



1. A process for improving the gas distribution in air-lift loop reactors of the type in which gas is supplied to a reactor vessel through multiple-outlet gas nozzle means disposed in a lower portion of the vessel and having a predetermined pluraiity of gas outlets, and a guide device disposed above the gas nozzle means separates liquid in the vessel into an upflow space in which gassed liquid rises to a degassing zone and a downflow space in which partially degassed liquid flows down to below the guide device, the guide device defining a free cross section for the rising gassed liquid in the upflow space; comprising the steps of damming said free cross section of said upflow space with damming means at the location of said gas nozzle means; providing a corresponding predetermined plurality of apertures in said damming means to define part streams at said damming means flowing therethrough into said upflow space, said liquid entering said upflow space only through said apertures with each aperture being associated with a respective one of said gas outlets disposed thereat, and the part streams having cross sections such that the sum of the cross sections of the part streams is less than the free cross section of the upflow space; and introducing gas through said gas outlets into said part streams.

4,545,946

METHOD AND EQUIPMENT FOR THE COMPACTING OF CONCRETE

Asko Sarja, Espoo, Finland, assignor to Sr-Kone Oy, Salpakangas, Finland

Filed Feb. 9, 1984, Ser. No. 578,504

Claims priority, application Finland, Feb. 9, 1983, 830454

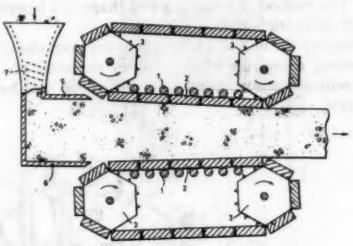
Int. Cl.⁴ B28B *1/08, 5/02, 23/18*

U.S. Cl. 264—70 **9 Claims**

1. A method of compacting concrete mix during the continuous casting of concrete products comprising the steps of providing a feeding device and an endless transfer unit which includes rigid plates of a caterpillar band and two or more support rolls, feeding concrete through said feeder device to the endless transfer unit, conveying the concrete through the endless transfer unit, and while the concrete is in the transfer unit, pressing the plates of the caterpillar band by means of said support rolls, adjusting the pressure applied by the plates by

changing the position of said support rolls, and vibrating said support rolls.

4. An apparatus for the continuous casting of concrete products comprising a feeder device for feeding concrete mix and an endless transfer unit, said endless transfer unit comprising



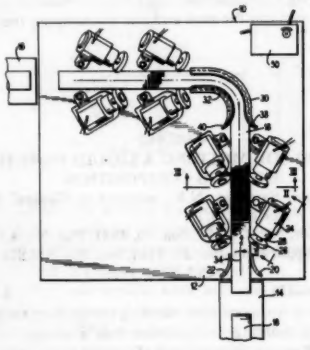
means for compacting the concrete mix including a caterpillar belt having a plurality of rigid plates and support rolls for pressing the plates against the concrete mix, said plates being movable to by-pass said support rolls, means for adjusting the distance between said support rolls and means for vibrating said support rolls.

4,545,947

METHOD OF STRENGTHENING POLYPROPYLENE HOSE

David B. Bozoarth, St. Joseph Township, Berrien County, and William R. Rickel, Royalton Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 2, 1983, Ser. No. 557,339
Int. Cl.[4] B29C *17/00*; B29D *23/04*
U.S. Cl. 264—150 **6 Claims**



1. The method of enhancing the molecular alignment of polypropylene hose comprising the steps:

extruding polypropylene into a hose shape at an elevated temperature,

forming corrugation in the hose,

advancing said hose through a bend, and

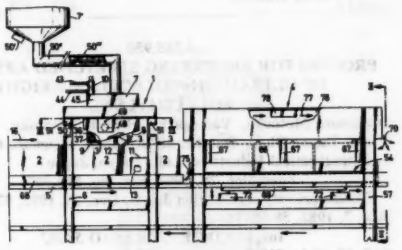
relatively rotating said hose or said bend through a plurality of 360 degree rotations while continuously advancing said hose through said bend.

4,545,948

METHOD FOR ADJUSTING IN THE HEIGHT BUILDING BLOCKS AND SIMILAR

Gérard De Waele, Heldergem, Belgium, assignor to Hanota Holdings SA, Luxembourg, Luxembourg

Continuation of Ser. No. 89,307, Oct. 30, 1979, abandoned. This application Sep. 29, 1982, Ser. No. 426,701
Claims priority, application Luxembourg, Oct. 31, 1978, 80453
Int. Cl.[4] B28B *3/12, 11/08*
U.S. Cl. 264—162 **26 Claims**



1. Method for adjusting to a predetermined height building blocks and similar, notably hollow concrete blocks to be laid dry upon one another and to be filled with a binder, said blocks having been formed in a mold with an actual height which is less than said predetermined height and then unmoulded, which method comprises laying over the top sides of the unmolded blocks forming the top edges of the block sidewalls upon which superimposed blocks bear in a block wall construction an amount of a substantially dry material which is hardenable and bindable thereon responsive to moisture with a height which is higher than the difference between said predetermined height and the actual height of the block under consideration, thereafter leveling said material over said block sides before hardening thereof until the total block height formed by the sum of said formed block height and said material height substantially corresponds to said predetermined height, said material being unconfined by any mold, both during the laying and the leveling, and adding moisture to said dry material to at least partly harden and bind said material to said blocks.

4,545,949

PROCESS FOR THE MANUFACTURE OF FLAME-RESISTANT AND HYDROPHILIC POLYESTER FIBERS

Wolfgang Lange, Obernburg, Fed. Rep. of Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Feb. 10, 1984, Ser. No. 578,944
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305629
Int. Cl.[4] D01D *1/10*
U.S. Cl. 264—170 **7 Claims**

1. A process for the preparation of polyester fibers comprising the steps of

(1) obtaining a polyester mass by the transesterification and subsequent polycondensation of terephthalic esters with ethylene glycol in the presence of transesterification catalysts containing metal cations, said cations being taken from the group consisting of divalent zinc, calcium, magnesium or manganese compounds;

(2) spinning said polyester mass with from 1 to 20% by weight of an oxalato complex of the general formula

$$Me_n[Z(C_2O_4)m]$$

wherein Me is an ion taken from the group consisting of

Li, Na, K, Rb, Cs and NH_4; Z is a complex-forming central atom taken from the group consisting of Mg, X, Ae, V, Zr, Hf, Ce, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Cd, B, Al, Ga, In, Sn, Pb, and Sb; n is ~1, ~2, ~3, or ~4; and m is ~2, ~3, or ~4;

(3) drawing the resulting fibers; and

(4) hydrosetting said fibers at an elevated temperature in the presence of liquid water;

characterized in that there is incorporated into the polyester mass, prior to spinning, a compound forming a sparingly soluble salt or a complex with the cation of said transesterification catalyst.

4,545,950

PROCESS FOR PRODUCING STRETCHED ARTICLES OF ULTRAHIGH-MOLECULAR-WEIGHT POLYETHYLENE

Masanori Motooka, Yamaguchi; Hitoshi Mantoku, Iwakuni, and Takao Ohno, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 28, 1983, Ser. No. 566,302

Claims priority, application Japan, Dec. 28, 1982, 57-227447; Apr. 7, 1983, 58-59976

Int. Cl.[4] D01F *1/10;* **D01D** *5/092*

U.S. Cl. 264—210.6 **10 Claims**

1. A process for producing a stretched article of ultrahigh-molecular-weight polyethylene, which comprises

(1) melt-kneading a mixture composed of (A) 15 to 80 parts by weight, per 100 parts by weight of the components (A) and (B) combined, of ultrahigh-molecular-weight polyethylene having an inherent viscosity [η], determined at 135° C. in decalin, of at least 5 dl/g and (B) 85 to 20 parts by weight, per 100 parts by weight of the components (A) and (B) combined, of a paraffinic wax having a melting point, determined by the DSC method, of 40° to 120° C. and a weight average molecular weight ($\bar{M}w$), determined by the GPC method, of at least 230 but less than 2,000 in a screw extruder while maintaining the temperature of the mixture at 180 to 280° C.,

(2) melt-extruding the molten mixture through a die kept at a temperature of 180° to 300° C., under a draft condition at a draft ratio of not less than 2,

(3) cooling the resulting unstretched extrudate to solidify it, and

(4) subjecting the unstretched solidified extrudate to a stretching treatment at a temperature of 60° to 140° C. at a stretch ratio of at least about 3:1.

4,545,951

METHOD AND APPARATUS FOR BELLING PIPE ENDS

John H. Gordon, 855 Brandywine Rd., Downingtown, Pa. 19335

Filed Jul. 30, 1984, Ser. No. 635,803

Int. Cl.[4] B29C *15/00, 17/07*

U.S. Cl. 264—322 **20 Claims**

1. A pipe belling apparatus comprising

a frame, the frame supporting a longitudinally aligned rail;

a pressure chamber reciprocal longitudinally along the rail between an initial position and a belling position, the pressure chamber defining an interior cavity and having a front aperture in communication with the cavity;

a shaped mandrel positioned with the interior cavity and being adapted to reciprocate between an initial position and a belling position in response to reciprocal movements of the pressure chamber;

pipe clamp means supported on the frame forwardly of the mandrel to secure one end of a length of pipe within the apparatus, the pipe clamp means being reciprocal between an initial position and a clamping position;

means to reciprocate the pressure chamber and mandrel to cause the pipe end to enter thepressure chamber cavity through the opening and the mandrel to enter the end of the pipe when the pressure chamber is reciprocatd to the said belling position;

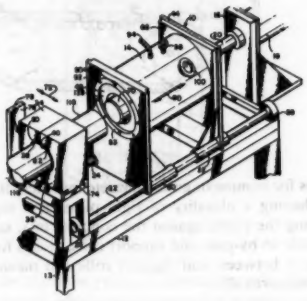
pressure inlet means in the pressure chamber to pressurize the pressure chamber cavity; and

seal means secured about the pressure chamber aperture to seal the pressure chamber about the pipe upon the application of pressurization force within the pressure chamber cavity.

9. The method of forming a bell shape in a heated end of a length of plastic pipe comprising

clamping the end of a heated pipe between clamps;

moving a pressure chamber from an initial position to a belling position about a portion of the said heated pipe end;



simultaneously moving a bell-shaped mandrel while within the pressure chamber from an initial position to a belling position and inserting the shaped mandrel into the heated pipe end;

creating a seal between the presure chamber and the pipe end;

pressurizing the pressure chamber and pressing the heated end of the pipe uniformly against the mandrel for a sufficient period of time to form the bell-shape of the mandrel in the pipe end; and

withdrawing simultaneously the pressure chamber and mandrel away from the pipe end and unclamping the pipe.

4,545,952

METHOD FOR MOLDING A LIQUID INJECTION MOLDING COMPOSITION

Aldo A. Laghi, Saratoga, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 272,242, Jun. 10, 1981, Pat. No. 4,436,496. This application Jan. 24, 1984, Ser. No. 573,881

Int. Cl.[4] B29F *1/00*

U.S. Cl. 264—328.2 **6 Claims**

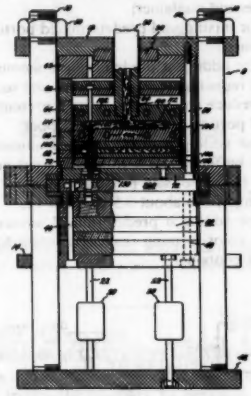
1. A method for runnerless molding comprising the steps:

(a) feeding molding composition into a conduit slidably mounted on the forward end of a mold frame means, and into a passage means of a first plate means fixedly mounted on the forward end of said conduit and adapted to slide within a support post means and within said mold frame means,

(b) retracting a pin means disposed in a nozzle means at the end of said passage means in said first plate means adjacent the rear end of said mold frame means away from said conduit means so as to open said nozzle means and fill a mold cavity means with said molding composition,

(c) returning said pin means into said nozzle means so as to

terminate further passage of said molding composition to said mold cavity means,



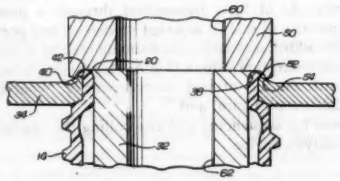
(d) causing said nozzle means to separate from said mold cavity means by retracting said first plate means, and
(e) curing said molding composition.

4,545,953

METHOD FOR MAKING AN EXTRUSION BLOW MOLDED NO DRIP LIP

James K. Cage, Santa Ana, and Edgardo I. Villena, Placentia, both of Calif., assignors to Hunt-Wesson Foods, Inc., Fullerton, Calif.

Filed Oct. 20, 1982, Ser. No. 435,628
Int. Cl.⁴ B29C *17/07, 17/10*
U.S. Cl. 264—533 **10 Claims**



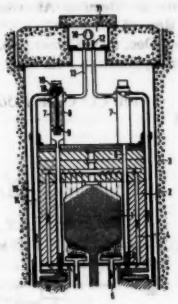
1. A process for making a container with a no-drip lip by extrusion blow molding comprising the steps of:
extruding thermoplastic material to form a parison having an open end and an adjacent annular neck;
positioning said annular neck between a blow pin on the inside and an anvil on the outside;
bringing a cutting and forming tool into contact with said parison at said open end in opposition to said anvil thereby cutting and forming said parison between said cutting and forming tool and said anvil to produce said no-drip lip, said lip being thus shaped such that it has a convex generally arcuate pouring surface and an undercut surface forming an acute angle with the horizontal that extends downwardly toward said pouring surface and meets said pouring surface to form a sharp downwardly directed annular edge; and
expanding said parison into a mold by the application of internal fluid pressure.

4,545,954

DEVICE FOR SHUTTING DOWN A HIGH-TEMPERATURE NUCLEAR REACTOR

Manfred Ullrich, Bergisch-Gladbach; Herbert Reutler, Cologne, and Hubert Schepers, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to GHT Gesellschaft für Hochtemperaturreaktor-Technik mbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,879
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104481
Int. Cl.⁴ G21C *7/22, 3/26*
U.S. Cl. 376—220 **2 Claims**



1. Device for shutting down a high-temperature nuclear reactor having a reactor core, comprising a reflector disposed outside the reactor core, channels being disposed in said reflector and having lower ends, storage bins being disposed above the reactor core and being in communication with said channels above said lower ends thereof, a neutron-absorbing material formed of fluidic bodies being storable in said storage bins and feedable into said channels, a plurality of lines connected between said lower ends of said channels and said storage bins, means for selectively establishing an unwardly directed fluid flow of said material in one of said plurality of lines for conveying said neutron-absorbing material at a given adequate speed from one of said channels into one of said storage bins.

4,545,955

CAN FOR CONTAINING MATERIAL FOR CONSOLIDATION INTO WIDGETS AND METHOD OF USING THE SAME

James Dickson, P.O. Box 172, Stirling, N.J. 07980

Filed May 18, 1983, Ser. No. 495,692
Int. Cl.⁴ B22F *1/00*
U.S. Cl. 419—38 **22 Claims**

1. A method for consolidation of material comprising the steps of:
(a) forming semipermeable can segments, said can segments when assembled forming one or more cavities;
(b) filling said cavities with the material to be consolidated;
(c) creating a closure for said material by assembling said can segments;

(d) heating said material contained in said can segments to a degassing temperature to cause gaseous contaminants to flow from the material through the semipermeable can segments;
(e) heating said can segments to a sealing temperature to cause said can segments to become nonpermeable; and
(f) applying sufficient pressure at a consolidation temperature to consolidate the material.

4,545,956

METHOD AND APPARATUS FOR DISINFECTING WATERLINES OF A MEDICAL DEVICE

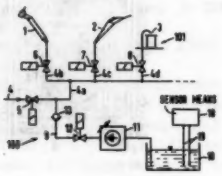
Hans-Joachim Ciszewski, Einhausen; Josef Pabst, Heddesheim, and Hans-Joerg Weisser, Bensheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,467

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246266

Int. Cl.⁴ C02F *1/50*

U.S. Cl. 422—28 **15 Claims**



1. A method for disinfecting water lines of a medical device having a plurality of water lines with individual control valves and a water supply with a main valve, said method comprising the steps of providing a supply of disinfectant in a concentration sufficient for long-term disinfection; shutting the main valve in the water supply to stop the flow of water through the water lines and the individual valves; then opening the individual control valves in the water lines and filling the water lines with the disinfectant from the supply of disinfectant; after filling the water lines with disinfectant closing the control valves to maintain the disinfectant in the lines for a prescribed period of time; and then subsequently flushing the water lines by opening the control valves and the main valve of the water supply to cause a flow of water through the water lines.

4,545,957

ANALYSIS SYSTEM FOR DETERMINING COPPER CONTENT IN WASTE WATER

Jacky Vanhumbeeck, Brugge; Laurent Danneels, Varsenare; Hubert De Steur, Drongen, and Guido Heyneman, Knokke, all of Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

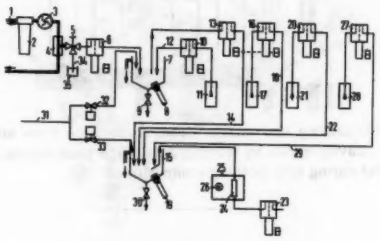
Filed Feb. 4, 1982, Ser. No. 345,924

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112553

Int. Cl.⁴ G01N *21/25*

U.S. Cl. 422—81 **1 Claim**

1. An automatic analysis device for determining total copper content in a waste-water containing an unknown amount of copper, comprising:
a first container and a second container,
means for periodically taking aqueous samples from such waste-water and for transferring such samples to said first container to form a sample batch in said first container;
means for mixing said sample batch taken in said first container;
means for adding to, and acidifying said sample batch in said first container with, a predetermined amount of a predetermined liquid that incorporates a metalliferous acid containing a metal which forms a cyanogen complex and which exhibits a larger electronegative potential than copper;
means for transferring a predetermined portion of the resulting so acidified sample batch from said first container to said second container;
means for mixing said predetermined portion in said second container;
means for adding a predetermined amount of a predetermined reducing agent solution to said second container so as to reduce any bivalent copper present in said predetermined portion to monovalent copper;
means for adding a predetermined amount of a predetermined buffer solution to said second container so as to adjust the pH of said predetermined portion to a value in the range from about 3.5 through 11;
means for adding a predetermined amount of a predetermined color-forming reagent solution for copper to said second container;



a colorimetric measuring bulb means,
means for transferring a predetermined quantity of the resulting such predetermined portion from said second container into said colorimetric measuring bulb means;
means including a microprocessor for measuring an absorption value for the intensity of a transmitted light which is passed through said predetermined quantity in said measuring bulb means;
means for determining the self-coloration and turbidity of said so adjusted predetermined portion whereby the intensity, A, of light transmitted through a predetermined quantity of said so adjusted predetermined portion before the addition of said color-forming reagent is measured and the absorption value k (log A − log B) thereof is calculated with the aid of said microprocessor, wherein k is the calibration factor, and
means for sequencing and controlling the operation of said analysis device.

4,545,958

MICROTITRATION PLATE

Hans-Detlef Dopatka, Marburg, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 485,831

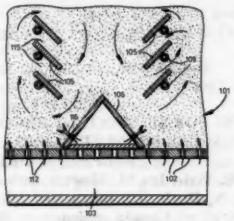
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214317

Int. Cl.⁴ B01L *3/00*; C12M *1/00*

U.S. Cl. 422—102 **7 Claims**

1. A microtitration plate adapted to be heated, comprising:
a continuous frame part having sidewalls and an upper surface extending within said frame part and projecting inwardly a predetermined distance from said sidewalls, said upper surface having an inwardly directed facing edge;
a central well portion situated within said frame part interiorly of said facing edge and having a plurality of vessels mounted thereon, said vessels having a predetermined height and width, said facing edge and the outer surface of said well portion defining a gap between said frame part and said well portion; and

an arrangement of ridges, said ridges being transverse support members integrally connected to diametrically opposed points on said sidewalls, said ridges also being



spaced longitudinally within said frame part, said ridges supporting said central well portion within said frame part.

4,545,959

TREATMENT CHAMBER WITH FLUIDIZED BED

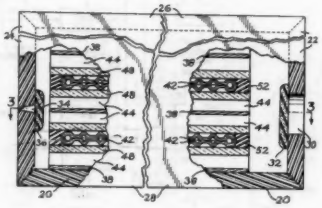
Hans-Dieter Schilling, Hattingen, and Lothar Holl, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jun. 7, 1983, Ser. No. 501,775

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1982, 3221567

Int. Cl.⁴ B01J *8/18;* **F27B** *15/00*

U.S. Cl. 422—142 **2 Claims**



1. An apparatus for treating a particulate mass, comprising:

a chamber bounded by imperforate lateral walls and an apertured bottom wall;

a source of carrier gas under pressure communicating with the interior of said chamber through said bottom wall;

a plurality of partitions in said chamber dividing the space above said bottom wall into at least one medial compartment and at least two additional compartments adjoining said at least one medial compartment at the opposite sides of said medial compartment, each of said partitions including a respective set of louvres spaced from each other in the vertical direction and slanted downwardly towards said at least one medial compartment, and said louvres of each set defining therebetween and between the lowest louvre and said bottom wall a plurality of openings establishing communication through the respective partition between directly adjacent compartments;

feed means located at an elevated level above said bottom wall for introducing a mass of particles to be treated into said at least one medial compartment;

a duct of substantially triangular cross-section with a horizontal base and upwardly sloping side walls located in said at least one medial compartment, said side walls of said duct extending in directions parallel to said partitions, and said base of said duct being imperforate and resting on said bottom wall and preventing the entry of said carrier gas into said at least one medial compartment from below; and

a respective nozzle arrangement in each of said upwardly sloping side walls of said duct, each nozzle arrangement being located adjacent the juncture between its respective sloping side wall and said base and in the vicinity of and below the lowermost louvre of the proximate one of said partitions, said nozzle arrangements having each nozzle axis thereof oriented at an upward slant relative to said bottom wall for directing an ancillary gas from said duct generally upward into said at least two additional compartments adjoining said at least one medial compartment to create a pressure differential between said medial compartment and each of its adjoining additional compartments, said nozzle arrangements ensuring the circulation of particles in said chamber by said carrier gas and said ancillary gas along a plurality of local loops generally rising in said adjoining additional compartments and descending in said at least one medial compartment.

4,545,960

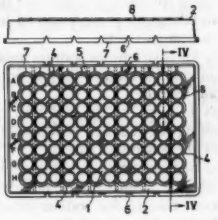
FLUID TREATMENT SYSTEM AND OZONE GENERATOR THEREFOR

Gerhard J. Erz, and Joseph M. Erz, both of 110 Browning Ave. SE., Apt. 1-D, Salem, Oreg. 97302

Filed Mar. 4, 1983, Ser. No. 472,035

Int. Cl.⁴ C01B *13/11*

U.S. Cl. 422—186.12 **2 Claims**



1. A fluid treatment system, comprising:

(a) circulating pump means having an upstream infeed end and downstream outlet end,

(b) fluid pipe means for connecting the upstream infeed end of said pump means to the sole source of fluid to be treated, for directing the entire volume of fluid through the pump means,

(c) ozone generator means comprising a housing having an air inlet at one end and an ozone outlet at the opposite end, and at least one pair of flat plate electrodes spaced apart to define an air passageway between them, one electrode of the pair having a plurality of dimpled projections on its surface facing the other electrode of the pair and wherein said dimpled electrode is protected from direct contact with air in the air passageway by a smooth surface plate of dielectric material, whereby the air passageway is formed between the confronting smooth surfaces of the flat plate electrode and dielectric plate,

(d) ozone delivery pipe means connected at one of its ends to said fluid pipe means and connected at its opposite end to said ozone outlet of the generator means, for treating the entire volume of fluid with ozone, and

(e) electric conductor means for connecting each said electrode to a source of high voltage.

4,545,961

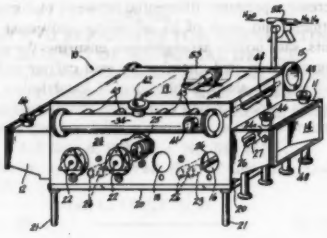
MULTI-COMPARTMENT DISC REACTOR WITH IMPROVED GAS INLET MANIFOLD

Julian K. Farmer, Bath, S.C., and Charles W. Hawk, Jr., Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 7, 1982, Ser. No. 385,347

Int. Cl.⁴ B01F *9/08, 13/04;* **B01J** *10/00*

U.S. Cl. 422—193 **8 Claims**



1. A rotating disc reactor for the production of sodium hydrosulfite in water comprising in combination:

(a) a reactor main housing having opposing end walls connected by opposing side walls, a top and a bottom;

(b) a piurality of elongate reaction compartments each of said compartments having a predetermined length with at least a partially arcuate interior periphery each compartment further having a top layer of a gas phase, an intermediate layer of a buffer solution and a bottom layer of sodium amalgam;

(c) a rotatable shaft with each reaction compartment about which are mounted a plurality of rotatable discs, each shaft being rotatably mounted to the opposing end walls and extending the predetermined length of its respective reaction compartment;

(d) means for distributing sodium amalgam into each of the reaction compartments in the bottom layer of sodium amalgam therein;

(e) means in each of the reaction compartments for the distributing recirculated buffer solution back into the top layer of the gas phase therein;

(f) at least one end box mounted to one of the opposing side walls having a plurality of inlet and outlet flow means connected thereto for sodium amalgam and product sodium hydrosulfite circulation;

(g) water supply means for supplying make up water connected to the means for distributing sodium amalgam; and

(h) sulfur dioxide inlet means sloped from the horizontal a predetermined amount towards the main housing, connected to each of the reaction compartments and having an arcuate interior through which sulfur dioxide passes, the sulfur dioxide inlet means further being offset from the reactor main housing a predetermined distance so that the sulfur dioxide enters the reaction compartments into the gas phase top layer and passes into the buffer solution intermediate layer by the action of the rotatable discs as they rotate about the rotatable shaft in each reaction compartment to mix the sodium amalgam, buffer solution and sulfur dioxide.

4,545,962

RECOVERY OF URANIUM FROM A MIXTURE OF WESTERN URANIUM ORE AND PHOSPHATE ROCK

William W. Berry, Lakeland, Fla., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Oct. 17, 1979, Ser. No. 85,676

Int. Cl.⁴ C01G *43/00*

U.S. Cl. 423—20 **5 Claims**

1. A process for recovering uranium values comprising the steps of forming a mixture comprising uranium-containing phosphate rock and western sandstone uranium ore; digesting said mixture with a sulfuric acid solution to produce a uranium-containing solution of phosphoric acid; and recovering said uranium values from said phosphoric acid solution.

4,545,963

PROCESS FOR SEPARATELY RECOVERING ZINC AND LEAD VALUES FROM ZINC AND LEAD CONTAINING SULPHIDIC ORE

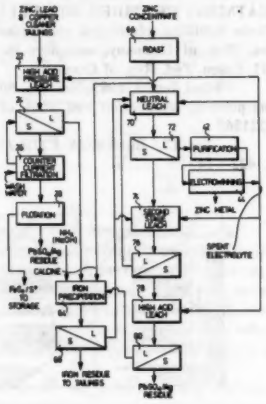
Donald R. Weir; Ian M. Masters, both of Fort Saskatchewan; Barry N. Doyle, Edmonton, and Michael E. Chalkley, St. Albert, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Sep. 26, 1983, Ser. No. 536,013

Claims priority, application United Kingdom, Sep. 29, 1982, 8227727

Int. Cl.⁴ C01G *3/00, 21/00, 9/00*

U.S. Cl. 423—26 **9 Claims**



1. A process for separately recovering zinc and lead values from zinc and lead containing sulphidic ore which also contains iron, the process comprising subjecting ground ore to a first flotation step to float an initial lead concentrate containing zinc and produce zinc and iron containing tailings, subjecting the zinc and iron containing tailings to a second flotation step to float an initial zinc concentrate containing iron and also produce tailings, subjecting the initial zinc concentrate to a third flotation step to float a further zinc concentrate containing iron and also produce zinc and iron containing tailings, leaching the zinc and iron containing tailings from the third flotation step and at least a lead and zinc containing portion of the initial lead concentrate in a first leach step under oxidizing conditions at a temperature in the range of from about 130° to about 170° C. in aqueous sulphuric acid solution with a stoichiometric excess of sulphuric acid relative to the zinc content of from about 50 to about 150% so as to give a terminal acidity of from about 50 to about 80 g/L to produce a lead-containing residue and a first leach solution containing zinc and iron, separating the lead containing residue from the first leach solution, treating the first leach solution with the further zinc concentrate or calcine produced therefrom by roasting to dissolve zinc therefrom and precipitate a substantial amount of dissolved iron, thereby producing an iron containing residue and a second leach solution containing zinc, separating the iron containing residue from the second leach solution, and treating the second leach solution to recover zinc.

4,545,964

PROCESS FOR THE PREPARATION OF POROUS PRODUCTS BASED ON COBALT FLUORIDE OR LEAD FLUORIDE

Pierre Bergez, Paris; Alain Deguelte, Les Lilas, and Laurent Seigneurin, Salindres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 16, 1983, Ser. No. 466,943
Claims priority, application France, Feb. 24, 1982, 82 03020
Int. Cl.[4] C01G *51/08*
U.S. Cl. 423—138 7 Claims

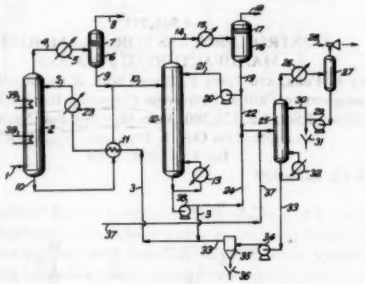
1. A process for producing cobalt fluoride useful in the preparation of porous products containing cobalt fluoride which comprises the steps of providing an amount of cobalt fluosilicate crystals and thermally decomposing the cobalt fluosilicate crystals at a temperature in the range of from about 200° to about 600° C. under vacuum or an inert atmosphere to provide cobalt fluoride powder having a specific surface of 10 to 120 m^2/g.

4,545,965

PROCESS OF SELECTIVE SEPARATION OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES CONTAINING ALSO CARBON DIOXIDE

Luigi Gazzi, Milan; Carlo Rescalli, San Donato Milanese; Maria A. Scaramucci, Milan, and Alessandro Ginnasi, San Donato Milanese, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Continuation of Ser. No. 215,169, Dec. 11, 1980, abandoned. This application Apr. 23, 1984, Ser. No. 602,736
Claims priority, application Italy, Jul. 4, 1980, 23241 A/80
Int. Cl.[4] C01B *17/16*
U.S. Cl. 423—229 4 Claims



1. A process for selective separation of hydrogen sulfide from gaseous mixtures containing carbon dioxide by selective absorption with a substantially anhydrous solution consisting essentially of:

(a) a tertiary amine selected from the group consisting of methyl diethanol amine, dimethyl ethanol amine, ethyl diethanol amine, diethyl ethanol amine, propyl diethanol amine, dipropyl ethanol amine, isopropyl diethanol amine, di-isopropyl ethanol amine, methyl di-isopropanol amine, ethyl di-isopropanol amine, propyl di-isopropanol amine, triethanol amine, N-methyl morphaline and mixtures thereof; and

(b) an organic solvent selected from the group consisting of sulfolane, N-methyl-pyrrolidone, N-methyl-3-morpholone, di-e-mono (C_1–C_4) alkylether-monoethylene glycol, di-e-mono (C_1–C_4) alkylether-polyethylene glycol, ethylene glycol, diethylene glycol, triethylene glycol, N,N-dimethylformamide, N-formyl-morpholine, N,N-dimethylimidazolidin-2-one, N-methyl-imidazole and mixtures thereof,

said tertiary amine being present in an amount between 10 and 70 percent by weight of the total solution and water present in the solution being less than 2 percent by weight of the total solution and selectively absorbing hydrogen sulfide.

4,545,966

CUPROUS ALUMINUM CYANO TRICHLORIDE: $CUAl(CN)Cl_3$: ITS PREPARATION AND USE FOR THE REVERSIBLE COMPLEXING OF UNSATURATED LIGANDS

David G. Walker, 904 Fleetwood Dr., Baytown, Tex. 77520

Filed Sep. 23, 1983, Ser. No. 535,165
Int. Cl.[4] C01B *21/18*
U.S. Cl. 423—245 5 Claims

1. The compound cuprous aluminum cyano trichloride of the formula: $CuAl(CN)Cl_3$.

2. A process for the separation of a ligand selected from the group consisting of olefins, acetylenes, and carbon monoxide from a feedstream, comprising the steps of:

(a) contacting the feedstream with a solution of $CuAl(CN)Cl_3$ in aromatics, and optionally containing solid $CuAl(CN)Cl_3$, to form a reaction mixture which contains a complex of the ligand with $CUAl(CN)Cl_3$;

(b) separating the reaction mixture from the feedstream;

(c) separating the ligand complex from the reaction mixture; and

(d) recycling the solution of $CuAl(CN)Cl_3$, optionally containing solid $CuAl(CN)Cl_3$, to step (a).

4,545,967

STABILIZED LANTHANUM SULPHUR COMPOUNDS

George H. Reynolds, San Marcos; Norbert B. Elsner, La Jolla, and Clyde H. Shearer, San Diego, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 25, 1983, Ser. No. 469,863
Int. Cl.[4] C01F *17/00*
U.S. Cl. 423—263 3 Claims

1. The method of forming a thermoelectric material of lanthanum sulfide which exhibits a stable phase form over a temperature range from about 500° C. to 1500° C. wherein thermoelectric properties exist, said method comprising the steps of:

blending at room temperature lanthanum sulfide and an ingredient selected from calcium, barium or strontium to form a lanthanum sulfide compound having the following formula:

$$(La, M)S_{1.5-x}$$

where x is greater than 0 and less than 0.1 and M is selected from the group consisting of calcium, barium or strontium, and M is present in an amount sufficient to stabilize the cubic phase of said material at temperatures as low as about 500° C.;

selecting M in an amount ranging from 0.1 to 5.0 weight percent;

slowly heating the blended ingredients in a vacuum to a temperature of about 1100° to 1200° C.;

allowing a chemical homogenization to occur; and

fabricating said thermoelectric material from the homogenized compound.

2. The method of forming a thermoelectric material of lanthanum sulfide which exhibits a stable cubic phase form over a temperature range from about 500° C. to 1500° C. wherein thermoelectric properties exist, said method comprising the steps of:

reacting lanthanum and an ingredient selected from calcium, barium or strontium with a sulfur vapor at a temperature of about 600° C. to 1200° C. in a closed reaction vessel to form a lanthanum sulfide compound having the following formula:

$$(La, M)S_{1.5-x}$$

where x is greater than 0 and less than 0.1 and M is selected from the group consisting of calcium, barium or strontium, and M is present in an amount ranging from 0.1 to 5 weight percent sufficient to stabilize the cubic phase of said material at temperatures as low as about 500° C.;

selecting M in an amount ranging from 0.1 to 5.0 weight percent;

allowing a chemical homogenization to occur in the reaction vessel; and

fabricating said thermoelectric material from the homogenized compound.

4,545,968

METHODS FOR PREPARING CUBIC BORON NITRIDE SINTERED BODY AND CUBIC BORON NITRIDE, AND METHOD FOR PREPARING BORON NITRIDE FOR USE IN THE SAME

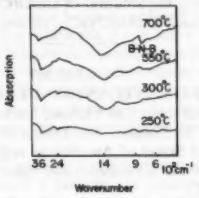
Shin-ichi Hirano, and Shigeharu Naka, both of Nagoya, Japan, assignors to Toshiba Tungaloy Co., Ltd., Kawasaki, Japan

Filed Nov. 2, 1984, Ser. No. 667,802

Claims priority, application Japan, Mar. 30, 1984, 59-63472; Mar. 30, 1984, 59-63473; May 21, 1984, 59-100682

Int. Cl.⁴ C01B *21/06*

U.S. Cl. 423—290 **23 Claims**



1. A method for preparing a cubic boron nitride sintered body which comprises the steps of:

pyrolyzing borazine and/or a borazine derivative consisting of boron, nitrogen and hydrogen to produce a boron nitride which has a B-H/B-N infrared absorption intensity of from about 0.1 to 0.7;

mixing said boron nitride with a catalyst composed of a metal and/or a metallic compound; and

reacting the mixture at a pressure of 3 GPa or more and at a temperature of 700° C. or more.

4,545,969

PROCESS FOR DEWATERING ZEOLITE SUSPENSIONS

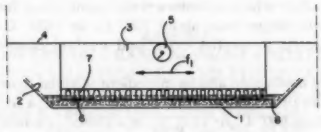
Friedrich W. Diekötter, Langenfeld; Edgar Hönges; Günther Just, both of Hilden, all of Fed. Rep. of Germany; Heinz-Gerd Smolka, Johannesburg, South Africa, and Willi Wüst, Ratingen, Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,293

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1982, 3233289

Int. Cl.⁴ C01B *33/28;* B01D *33/00*

U.S. Cl. 423—328 **9 Claims**



1. In a process for dewatering a zeolite suspension by introducing said suspension to the top surface of a horizontally circulating filter cloth and applying vacuum filtration to remove water from said suspension by means of a horizontally extending suction drying zone positioned under said filter cloth so as to form a partially dried zeolite filter cake, the improvement comprising:

removing additional water by introducing vibratory shearing forces into said partially dried zeolite filter cake, at a vibratory amplitude sufficient to cause at least partial reversible liquefaction thereof, by means of at least one vibrator positioned within said suction drying zone above said filter cake and having an operatively connected horizontally vibratory baffle plate extending downward into said partially dried zeolite filter cake and oscillating perpendicularly to the direction of movement of said filter cloth, while continuing the application of said vacuum filtration.

4,545,970

METHOD FOR THE FORMATION OF CALCIUM SILICATE AND THE RESULTING STRUCTURE

Pieter Krijgsman, Lindenhof, Groteweg 10, 8191JW Wapenveld, Hattem, Netherlands

Filed Oct. 28, 1981, Ser. No. 315,694

Int. Cl.⁴ C01B *33/24*

U.S. Cl. 423—331 **8 Claims**

1. In a process for the formation of calcium silicate from calcium hydroxide and silicon dioxide, the improvement comprising:

adding an acetate to the reaction constituents prior to the reaction of these constituents to form the calcium silicate crystals wherein said acetate is selected from the group consisting of magnesium acetate, manganese acetate and nickel acetate.

4,545,971

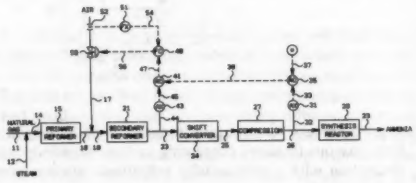
CONTROL PROCESS FOR AN AMMONIA MANUFACTURING PROCESS

Gary L. Funk, and Terry E. Bland, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 476,700, Mar. 18, 1983, Pat. No. 4,485,070. This application Oct. 1, 1984, Ser. No. 655,826

Int. Cl.⁴ C01C *1/04*

U.S. Cl. 423—359 **5 Claims**



1. A method for controlling an ammonia manufacturing process, wherein a primary reformer is utilized to convert at least a portion of a hydrocarbon feed stream to carbon monoxide and hydrogen, wherein a secondary reformer which is provided with the effluent from said primary reformer and with a stream of air is utilized to form additional carbon monoxide, wherein a shift converter and a compression system are utilized to produce a synthesis gas from the effluent from said secondary reformer and wherein an ammonia synthesis reactor is utilized to produce ammonia from the hydrogen and nitrogen contained in said synthesis gas, said method comprising the steps of:

establishing a first signal representative of the actual hydrogen to nitrogen ratio in said synthesis gas;

establishing a second signal representative of the desired hydrogen to nitrogen ratio in said synthesis gas;

comparing said first signal and said second signal and establishing a third signal which is responsive to the difference

between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the ratio of hydrogen and carbon monoxide to nitrogen in the effluent stream withdrawn from said secondary reformer required to maintain the actual hydrogen to nitrogen ratio in said synthesis gas substantially equal to the desired ratio represented by said second signal;

establishing a fourth signal representative of the actual hydrogen and carbon monoxide to nitrogen ratio in the effluent stream withdrawn from said secondary reformer;

comparing said third signal and said fourth signal and establishing a fifth signal which is responsive to the difference between said third signal and said fourth signal; and

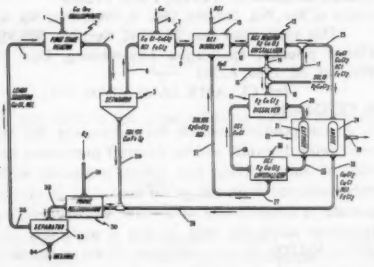
manipulating the flow of air to said secondary reformer in response to said fifth signal to thereby maintain the actual hydrogen to nitrogen ratio in said synthesis gas substantially equal to the desired ratio represented by said second signal.

4,545,972

PROCESS FOR RECOVERY OF METAL CHLORIDE AND CUPROUS CHLORIDE COMPLEX SALTS

Leonard R. Ochs, Tucson, Ariz., assignor to Duval Corporation, Houston, Tex.

Division of Ser. No. 272,024, Jun. 9, 1981,. This application May 19, 1982, Ser. No. 380,019
Int. Cl.[4] C01B *9/02*
U.S. Cl. 423—463 **10 Claims**



1. A method for the production and recovery of a complex salt of alkali metal chlorides, alkaline earth metal chlorides or ammonium chloride with cuprous chloride which comprises:

(a) forming a solution containing cuprous chloride wherein the cuprous chloride solution is a reduced leach solution or pregnant liquor obtained by oxidation of a copper sulfide ore with ferric chloride and cupric chloride;

(b) adding sufficient metallic copper to the reduced leach solution to reduce a sufficient amount of cupric ions present to cuprous ions so as to provide a solution containing about 1.5 to 2.5 molal cuprous chloride;

(c) adding sufficient alkali metal- alkaline earth metal-, or ammonium chloride to the solution to provide a resulting solution having a concentration of about 4.0 to 6.0 molal of added alkali metal ion or ammonium ion, or in the case of alkaline earth metal chloride, a sufficient amount to provide a resulting solution which is about 2.0 to 3.0 molal of added alkaline earth metal ion, wherein at least 2.0 moles of alkali metal- or ammonium chloride, or at least 1.0 mole of alkaline earth metal chloride, are added per mole of cuprous chloride that must be removed from the system;

(d) allowing a sufficient time period for the complex salt to form;

(e) allowing the complex salt crystals of alkali metal-, alkaline earth metal-, and/or ammonium-chloride-cuprous chloride to precipitate; and

(f) recovering the complex salt.

4,545,973

COMPLEX METAL CHALCOGENIDES

James P. King, Lansdale, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 9, 1983, Ser. No. 502,787
The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.
Int. Cl.[4] C01B *17/45*
U.S. Cl. 423—512 R **10 Claims**

1. The compounds having the formula:

$$M_p(M'O_xA_{4-x})_m.nH_2O$$

where M is a metal selected from the group consisting of: Mg, V, Mn, Fe, Co, Al, Cu, Ga, In, Bi, As, Ni, Zn, Cd, Sb, Sn and Ce;

where M' is a metal selected from the group consisting of Mo and W;

where A is S or Se;

where x ranges from 1 to 3;

where p is 1 or 2;

where m ranges from 1 to 5;

and n ranges from 0 to 6.

4,545,974

PROCESS FOR PRODUCING ALKALI METAL FERRATES UTILIZING HEMATITE AND MAGNETITE

John A. Thompson, Nassau, The Bahamas

Filed Mar. 16, 1984, Ser. No. 590,567
Int. Cl.[4] C01G *49/00*
U.S. Cl. 423—594 **23 Claims**

1. A method for producing alkali metal iron (IV) ferrate comprising the steps of:

(a) forming a particulate mixture of reactants including an alkali metal nitrogen oxygen compound selected from the group consisting of alkali metal nitrate and alkali metal nitrite; and an iron material selected from the group consisting of, Fe_2O_3, Fe_3O_4, hematite, magnetite, and an iron compound which thermally decomposes at a temperature less than about 1100° C. to form Fe_2O_3; and

(b) subjecting the mixture of reactants to a temperature in the range of about 780° C. to about 1100° C. for a period of time in the range of about 5 minutes to about 2 to 3 hours, in an atmosphere in which there is an absence of free oxygen, sufficient to bring about a reaction to produce alkali metal iron (IV) ferrate.

13. A method for producing alkali metal iron (VI) ferrate comprising the steps of:

(a) forming a particulate mixture of reactants including an alkali metal nitrogen oxygen compound selected from the group consisting essentially of alkali metal nitrate and alkali metal nitrite; and an iron material selected from the group consisting of Fe_2O_3, Fe_3O_4, hematite, magnetite, and an iron compound which thermally decomposes at a temperature less than about 1100° C. to form Fe_2O_3; and

(b) subjecting the mixture of reactants to a temperature in the range of about 780° C. to about 1100° C. for a period of time in the range of about 5 minutes to about 2 hours, in an atmosphere in which there is an absence of free oxygen, sufficient to bring about a reaction to produce alkali metal iron (VI) ferrate.

4,545,975

PROCESS AND APPARATUS FOR PRODUCING A HIGH PURITY MAGNESIA FINE POWDER

Waichi Kobayashi; Kozaburo Yoshida, and Hideaki Igarashi, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed May 16, 1984, Ser. No. 610,650
Claims priority, application Japan, May 20, 1983, 58-88889
Int. Cl.[4] C01B *33/18*
U.S. Cl. 423—636 **7 Claims**

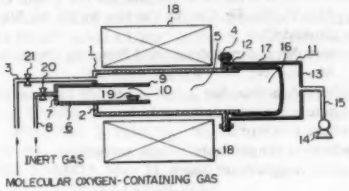
1. A process for producing a high purity magnesia powder

having an improved sintering property, comprising the steps of:

(A) vaporizing magnesium at a temperature of 700° C. or more in a magnesium-vaporizing region while flowing an inert gas through said magnesium-vaporizing region;

(B) introducing said inert gas containing the resultant vaporized magnesium from step (A) into a magnesium-oxidizing region;

(C) flowing a molecular oxygen-containing gas concurrently with said vaporized magnesium-containing inert gas through said magnesium-oxidizing region to provide a reaction mixture, while maintaining the partial pressure of said vaporized magnesium in the magnesium-oxidizing



region at 0.09 atmospheres or less and maintaining the partial pressure of said oxygen gas at one-half times the pressure of said vaporized magnesium or more while also maintaining the temperature in said magnesium-oxidizing region at a level of from 800° C. to 1,600° C., to oxidize said vaporized magnesium with said molecular oxygen-containing gas into a high purity magnesia fine powder having particle sizes of 0.03 μm or less;

(D) introducing the flow of said reaction mixture containing the resultant magnesia fine powder into a magnesia-collecting region; and

(E) collecting said high purity magnesia fine powder from said reaction mixture in said magnesia collecting region.

4,545,976

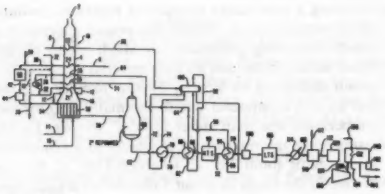
HYDROCARBON STEAM REFORMING USING SERIES STEAM SUPERHEATERS

Robert M. Osman, Parsippany, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 10, 1983, Ser. No. 550,552

Int. Cl.⁴ C01B *3/24*; C07C *1/02*

U.S. Cl. 423—650 **14 Claims**



1. In a process for steam reforming of a hydrocarbon gas feedstream wherein:

(a) the hydrocarbon gas feedstream is partially reformed at elevated temperatures in indirect heat exchange with hot combustion gases in a direct fired primary reforming furnace provided with a convection section for recovery of excess heat from said combustion gases; and (b) the partially reformed feedstream is then further reformed in the presence of an oxygen-containing gas and steam in a secondary reformer to form a secondary reformer gaseous effluent the improvement which comprises recovering waste heat from said secondary reformer effluent gas and from said primary reforming combustion products by (i) heating a high pressure saturated steam in a first steam superheating zone by indirect heat exchange with at least a portion of said secondary reformer effluent gas to form a first superheated steam stream; and (ii) further heating said first superheated steam in a second steam superheating zone by indirect heat exchange with at least a portion of said primary reformer hot combustion gases to form a second superheated steam stream.

4,545,977

COMPOSITIONS AND METHODS FOR TREATING SEVERE ACNE WITH ISOTRETINOIN

Gerald E. Gaull, New York, N.Y., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jan. 11, 1985, Ser. No. 690,707

Int. Cl.⁴ A61K *31/20*

U.S. Cl. 424—10 **13 Claims**

1. A pharmaceutical composition for the treatment of severe cystic acne comprising a therapeutically effective amount of isotretinoin and a protective amount of taurine.

4,545,978

HAIR-DYEING PROCESS INVOLVING PROTECTION OF THE SCALP

Gregoire Kalopissis, Neuilly-sur-Seine; Jacqueline Gallien, Aulnay-sous-Bois; Bernard Jacquet, Antony; Daniel Bauer, Le Raincy, and Jean Phillipe Chalaye, Maisons Alfort, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 214,864, Dec. 9, 1980, Pat. No. 4,402,698.

This application Jun. 27, 1983, Ser. No. 508,010

Claims priority, application Luxembourg, Dec. 13, 1979, 81994; Jul. 30, 1980, 82581

Int. Cl.⁴ A61K *33/44, 47/00, 7/13*

U.S. Cl. 424—10 **3 Claims**

1. A composition suitable for protecting the skin from contact with dyestuffs and/or dyestuff precursors during the dyeing of human living hair which comprises at least one member selected from the group consisting of charcoal, carrageenate, a cosmetically acceptable polymer derived from polystyrene sulphonic acid having a molecular weight of 50,000 to 500,000, alumina, alumino-silicate or aluminum phosphate or mixtures thereof in suspension or in solution in water, ethanol, isopropanol, polyethylene glycol, glycerol or their mixtures; and polyethylene glycol as a plasticizer, said composition having a viscosity of 80 to 8,000 cps suitable for application on the scalp, said composition being removable with water or with shampoo and substantially preventing the passage of dyestuffs in a para-phenylene diamine oxidation dyeing composition into a paper when it is applied to a sheet of paper to a thickness of 1 mm.

4,545,979

DENTAL HYGIENE COMPOSITIONS

Suhas H. Ambike, Westhill; Narinder S. Grewal, Scarborough, and Eric Blaser, Toronto, all of Canada, assignors to Warner-Lambert Company, Morris Plains, N.Y.

Continuation of Ser. No. 350,671, Feb. 22, 1982, abandoned.

This application Sep. 26, 1984, Ser. No. 655,274

Int. Cl.⁴ A61K *7/16, 7/18*

U.S. Cl. 424—52 **13 Claims**

1. Dental hygiene composition having antimicrobial activity against plaque-forming microorganisms and comprising an effective amount of from 0.1 to 2.0 percent by weight of one or more highly pure alkali metal salts of dodecyl sulphate having less than 5% non-dodecyl alkyl sulphate salts, 0.5 to 2.0% by weight of alkali metal N-acyl sarcosinate, and a physiologically-acceptable acidic buffer at pH in the range of 3.0 to 5.0, dissolved in one or more vehicles physiologically compatible with the teeth and mouth tissues.

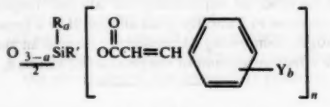
4,545,980

ORGANOSILOXANES AND PREPARATION THEREOF

Michael P. Hill, Saint Lythans, Wales, assignor to Dow Corning Ltd., Barry, Wales

Filed Mar. 1, 1985, Ser. No. 707,340
Claims priority, application United Kingdom, Mar. 5, 1984, 8405731
Int. Cl.[4] C07F 7/08, 7/18
U.S. Cl. 424—60 9 Claims

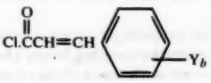
1. A process for the preparation of an organosiloxane having in the molecule at least one unit of the general formula



wherein R represents an alkyl group having from 1 to 4 inclusive carbon atoms or a phenyl group, R′ represents an aliphatic or aromatic group having a valency of n+1 and being composed of carbon and hydrogen or of carbon, hydrogen and oxygen wherein the oxygen is present in the form of ether linkages or in hydroxyl groups, Y when present represents a hydroxyl group or an alkoxy group having from 1 to 4 carbon atoms, a has a value of 0, 1 or 2, b is 0 or 1 and n is 1, 2 or 3, said process comprising reacting together (A) an organosiloxane having in the molecule at least one unit of the general formula

any remaining units in the organosiloxane having the general formula

wherein R and a are as hereinabove defined, G represents a monovalent aliphatic or aromatic group composed of carbon, hydrogen and, optionally, oxygen in the form of ether linkages and having substituted therein at least one alcoholic or phenolic hydroxyl group, Q represents a monovalent hydrocarbon group and d is 0, 1, 2 or 3, and (B) a compound having the general formula



Y and b being as hereinabove defined.

4,545,981

NAIL ENAMEL CONTAINING POLYTETRAHYDROFURAN AS A RESIN

Bernard Jacquet, Antony; Christos Papantoniou, Montmorency, and Quintino Gaetani, Bondy, all of France, assignors to L'Oreal, Paris, France

Filed Nov. 23, 1982, Ser. No. 443,891
Claims priority, application France, Nov. 24, 1981, 81 21954
Int. Cl.[4] A61K 7/04
U.S. Cl. 424—61 8 Claims

1. In a nail enamel composition comprising nitrocellulose as a film forming agent, a resin for modifying said film forming agent and a solvent, the improvement comprising said resin for modifying said film forming agent consisting essentially of polytetrahydrofuran having an average molecular mass between 300 and 300,000 as determined by size exclusion chromatography.

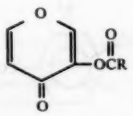
4,545,982

PYRANONE COMPOUNDS AND SKIN-LIGHTENING COSMETIC PREPARATIONS OR LOCAL DEMELANIZING AGENTS CONTAINING THE SAME

Hidehiko Takahashi, Tokyo, Japan, assignor to Yakurigaku Chuo Kenkyusho, Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,867
Int. Cl.[4] A61K 7/135
U.S. Cl. 424—62 5 Claims

1. 3-acyloxy-4(H)-pyran-4-one compounds having the formula:



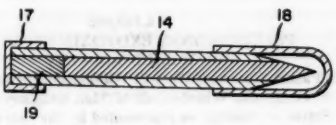
wherein R is an alkyl group having 1–17 carbon atoms.

4,545,983

METHOD FOR MAKING COSMETIC PENCILS

Julio G. Russ, Germantown, and Donna L. Barrom, Arlington, both of Tenn., assignors to Plough, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 296,386, Aug. 26, 1981, Pat. No. 4,383,875. This application Mar. 7, 1983, Ser. No. 472,543
The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.
Int. Cl.[4] A61K 7/21, 7/25; B65B 7/28
U.S. Cl. 424—63 7 Claims



1. A method for strengthening a cosmetic lead of solvent-based cosmetic composition comprising at least one wax or resin, solvent for said wax or resin, and pigment, comprising the steps of:

(a) packaging said lead in an airtight container

(b) storing said packaged lead at a temperature below approximately 0° C. for approximately 12 to 168 hours, thereafter

(c) storing the packaged lead at room-temperature for at least two hours, and thereafter

(d) removing said lead from said airtight container.

4,545,984

ARENE-CARBOXYLIC ACID DERIVATIVES AS ANTISEBORRHEIC ADDITIVES FOR COSMETIC AGENTS

Hinrich Möller; Siegfried Wallat, both of Monheim, and Friedhelm Bartnik, Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/EP82/00109, § 371 Date Nov. 15, 1982, § 102(e) Date Nov. 15, 1982, PCT Pub. No. WO82/04189, PCT Pub. Date Dec. 9, 1982

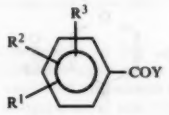
PCT Filed May 21, 1982, Ser. No. 444,587

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121064

Int. Cl.⁴ A61K *7/06, 31/235*

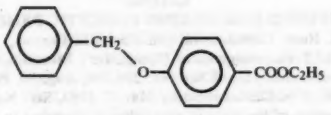
U.S. Cl. 424—70 **9 Claims**

1. A process for reducing sebaceous cell sebum production in a mammal in need thereof which comprises contacting said sebaceous cell in the skin of said mammal with an effective amount to reduce sebum production of at least one compound of the formula (I):



in which R^1, R^2 and R^3 represent independently of one another an alkoxy with 1 to 20 carbon atoms, or an alkoxy with 1 to 20 carbon atoms substituted with hydroxy, phenyl, or alkoxy as well as aryloxy, and Y represents an alkoxy with 1 to 12 carbon atoms or aralkoxy.

6. A topical cosmetic preparation for the treatment of seborrhea containing an antiseborrheically effective amount of a compound having the formula



as an antiseborrheic, and further containing conventional vehicles and additives for topical application.

4,545,985

PSEUDOMONAS EXOTOXIN CONJUGATE IMMUNOTOXINS

Ira Pastan, Potomac; Mark C. Willingham, Bethesda, and David J. Fitzgerald, Wheaton, all of Md., assignors to The United States of America as represented by the Secretary, Dept. of Health and Human Services, Washington, D.C.

Filed Jan. 26, 1984, Ser. No. 574,173

Int. Cl.⁴ A61K *39/00, 39/02, 37/00;* **A23J** *1/06*

U.S. Cl. 424—85 **16 Claims**

1. A method for the chemotherapeutic alleviation of cancer in animals consisting essentially of injecting a chemotherapeutically alleviating amount of an immunotoxin conjugate which comprises a modified *Pseudomonas exotoxin* (PE) and a modified cancer cell binding protein wherein said PE is modified by treatment with methylmercaptobutyrimidate (MMB) followed by treatment with dithiobis(2-nitrobenzoic acid) and wherein said cancer cell binding protein is modified by treatment with a reagent selected from the group consisting of MMB and m-maleimidobenzoyl N hydroxy-succinimide ester under conditions which effect the formation of a disulfide or thioether bond between said PE and said cancer cell-binding protein.

4,545,986

TIMOTHY GRASS ANTIGEN SPECIFIC ANTI-IDIOTYPIC ANTIBODIES

Arthur Malley, Portland, Oreg., assignor to Research Corporation, New York, N.Y.

Filed Jun. 22, 1982, Ser. No. 390,923

Int. Cl.⁴ A61K *39/395, 39/36, 37/02;* **C07G** *7/00;* **C12P** *2/00;* **C12N** *5/00, 5/02*

U.S. Cl. 424—85 **29 Claims**

5. The antibody anti-IgE_{id}.

13. The antibody, anti-T_{HF}.

24. The protein fraction T_{SF2}.

27. A method for suppressing the allergic response of an animal sensitive to Timothy grass antigen B or a cross reactive grass antigen comprising administering thereto an anti-allergic response effective amount of the product of claims **5**, **13**, or **24**.

4,545,987

PSORALEN INACTIVATED DOUBLE-STRANDED RNA VIRAL VACCINES

Richard E. Giles, Alameda; David R. Stevens, Fremont, and Gary P. Wiesehahn, Alameda, all of Calif., assignors to Advanced Genetics Research Institute, Oakland, Calif.

Filed Dec. 20, 1983, Ser. No. 563,939

Int. Cl.⁴ A61K *39/12*

U.S. Cl. 424—89 **11 Claims**

1. A vaccine useful for inoculation of a mammalian host susceptible to infection by Bluetongue virus (BTV), which comprises at least one furocoumarin-inactivated BTV serotype in from about 10^6 to 10^9 pfu/ml, wherein said inactivation is as a result of irradiation of BTV in the presence of an inactivating furocoumarin with long wavelength ultraviolet light at a temperature below about 40° C. for a time sufficient to inactivate said BTV to a non-infectious degree, and an immunologic adjuvant.

4,545,988

UROKINASE-PLASMIN COMPLEX ADSORBABLE BY FIBRIN AND PROCESS FOR PREPARING SAME

Yasuo Nakayama; Wasei Miyazaki, and Masanao Shinohara, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

Filed Dec. 18, 1984, Ser. No. 683,024

Claims priority, application Japan, Dec. 23, 1983, 58-251990

Int. Cl.⁴ A61K *37/54;* **C12N** *9/68, 9/72, 9/96*

U.S. Cl. 424—94 **8 Claims**

1. A urokinase complex adsorbable by fibrin characterized in that it comprises heavy chain of high molecular weight urokinase as coupled with heavy chain of plasmin by one or more S—S bonds.

4. A process for preparing a urokinase complex adsorbable by fibrin characterized by coupling heavy chain of high molecular weight urokinase with heavy chain of plasmin by an intermolecular disulfide interchange reaction.

4,545,989

CHEWABLE COMESTIBLE PRODUCT

Amy J. Becker, New York; Leonard P. Abbazia, Brooklyn, and Mario W. Medri, Huntington, all of N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 303,268, Sep. 17, 1981, abandoned. This application Dec. 6, 1983, Ser. No. 558,652

Int. Cl.⁴ A61K *33/06;* **A23J** *9/00, 3/00*

U.S. Cl. 424—154 **35 Claims**

1. A chewable comestible product, which comprises:

(1) from about 10% to about 35% of a frappé component having a density of at least 1.0 comprising,

(a) whipping agent present in an amount of from 1.0% to about 9% by weight of said frappé component;

(b) corn syrup in an amount of up to about 80% by weight of said frappé component;

(c) sugar in an amount of up to about 40% by weight of said frappé component;
(d) water in an amount of from about 4% to about 25% by weight of said frappé component;
(e) an antacid compound in the amount of about 30% to about 55%; and
(2) a syrup component comprising,
(a) a corn syrup in the amount of about 20% to about 55% by weight of the syrup component;
(b) sugar in the amount of from 45% to about 80% by weight of the syrup component;
(c) starch in the amount of up to about 7% by weight of the syrup component; and
(d) water in the amount of up to about 13% by weight of the syrup component, said syrup component comprising the remainder of the comestible product.

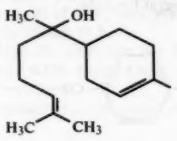
4,545,990

ANTI-ACNE COMPOSITION

Carol Le Foyer de Costil; Liliane Ayache, both of Paris, and Jean-Paul Tisseyre, Saint-Cloud, all of France, assignors to L'Oreal, Paris, France

Filed Nov. 21, 1983, Ser. No. 553,977
Claims priority, application Luxembourg, Nov. 22, 1982, 84485
Int. Cl.[4] A61K *31/70, 35/78, 31/235*
U.S. Cl. 514—557 **10 Claims**

1. An anti-acne composition for local treatment of acne comprising benzoyl peroxide in an amount of 1 to 20 weight percent based on the total weight of said composition and at least one other active principle present in an amount of 0.1 to 15 weight percent based on the total weight of the composition so as to suppress or eliminate the skin irritating action of benzoyl peroxide and being selected from the group consisting of collagenic palmitoyl acid, glycyrrhetinic acid, bisabolol having the formula



and a meristem extract which is a water soluble extract derived from the root tip of leaf-bearing trees and comprising 3,4,5-trihydroxybenzoic acid or gallic acid in an ointment, emulsion or gel.

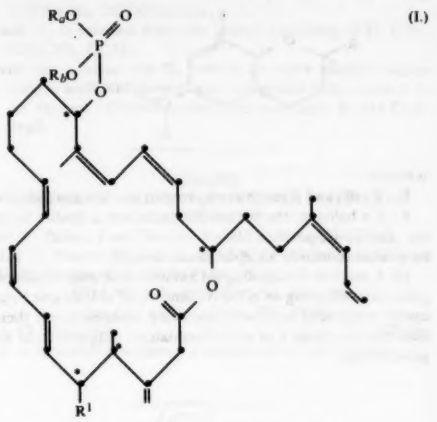
4,545,991

DIFFICIDIN AND DERIVATIVE ANTIBACTERIALS

Sheldon B. Zimmerman, Springfield; Kenneth E. Wilson, Westfield; Richard L. Monaghan, Somerset, all of N.J.; Sagrario M. Del Val; Maria I. M. Fernandez, both of Madrid, Spain; Otto D. Hensens, Red Bank, N.J.; James E. Flor, Bridgewater, N.J., and Cheryl Deriso, Avenel, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 13, 1983, Ser. No. 503,951
Int. Cl.[4] A61K *31/665;* **C07F** *9/16*
U.S. Cl. 514—100 **5 Claims**

1. A compound of the formula:



(I.)

where R_a and R_b are members independently selected from the group consisting of hydrogen; alkali metal and alkaline earth metal cations; ammonium; and substituted ammonium; and R^1 is hydrogen or hydroxy.

4. A pharmaceutical composition for inhibiting the growth of bacteria comprising an antibacterially effective amount of a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,545,992

PHARMACEUTICAL PREPARATIONS

Takuzo Kamishita, Takatsuki, Japan, assignor to Toko Yakuhin Industry Co., Ltd., Osaka, Japan

Filed Jul. 26, 1982, Ser. No. 401,707
Claims priority, application Japan, Aug. 14, 1981, 56-128032
Int. Cl.[4] A61K *31/19, 31/34, 31/38, 31/40, 31/44, 31/54, 31/61, 37/185, 31/415*
U.S. Cl. 514—161 **7 Claims**

1. A pharmaceutical preparation for external use comprising a solution of from about 0.5 to about 3.0% by weight of a non-steroid compound wherein the non-steroid compound is ibuprofen, ketoprofen, flurbiprofen, naproxen, benoxaprofen, fenoprofen, ibufenac, alclofenac, diclofenac, tiaprofenic acid, fentiazac or fenbufen, the non-steroid compound being dissolved in at least one adjuvant selected from the group consisting of peppermint oil, methyl salicylate, ethyl salicylate and monoglycol salicylate in an amount of from 1 to 16 parts of the adjuvant per part of the non-steroid compound, and a base for external use.

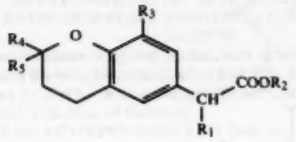
4,545,993

1,2-BENZOPYRAN-6-YL ACETIC ACID COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAID COMPOUNDS

Kaoru Okamoto; Masaki Hamada, and Teikichi Kurosaki, all of Osaka, Japan, assignors to Nippon Zoki Pharmaceutical Co. Ltd., Hiranomachi, Japan

Filed Jul. 20, 1982, Ser. No. 400,029
Claims priority, application Japan, Aug. 12, 1981, 56-126912
Int. Cl.[4] A61K *31/35;* **C07D** *311/70*
U.S. Cl. 514—456 **13 Claims**

1. A heterocyclic compound having the formula (I):



(I)

wherein:

R_1, R_2, R_4 and R_5 each are hydrogen or a lower alkyl group;

R_3 is a halogen; the broken line connotes a double bond at the C_3–C_4 position,

or pharmaceutically acceptable salt thereof.

10. A method for treating inflammation or pain which comprises administering an effective amount of at least one heterocyclic compound or pharmaceutically acceptable salt thereof according to claim **1** or antiinflammatory, antipyretic, or analgesic action.

4,545,994

TRIHALOALLYL THIOCYANATES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN MICROBICIDAL AGENTS

Hans-Georg Schmitt, Leverkusen; Wilfried Paulus, and Hermann Genth, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

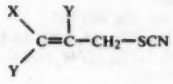
Filed Nov. 13, 1984, Ser. No. 670,173

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341556

Int. Cl.[4] **A01N** *47/46;* **C07C** *161/02*

U.S. Cl. 514—514 **16 Claims**

1. A trihaloallyl thiocyanate of the formula



wherein X and Y are identical or different and denote chlorine, bromine or iodine.

4,545,995

SUBSTITUTED PHENYLALKENYL AMMONIUM SALTS AS ANTIARRHYTHIMC AGENTS

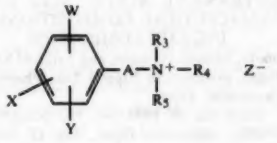
William C. Lumma, Jr., Pennsburg, Pa., and Ronald A. Wohl, Morris Plains, N.J., assignors to Schering A.G., Berlin, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,144

Int. Cl.[4] **A61K** *31/275, 31/14;* **C07C** *121/50, 91/00*

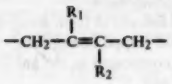
U.S. Cl. 514—523 **29 Claims**

1. A compound of the following general formula:



wherein

A is



R_1, R_2 are both hydrogen or both C_1–C_2 alkyl, or when taken together are $—(CH_2)_3—$ or $—(CH_2)_4—$ to form the cyclopentene or cyclohexene moiety;

R_3, R_4 are both C_1–C_4 alkyl;

R_5 is C_{5-C10} alkyl, phenyl C_1–C_4 alkyl or cycloalkyl lower alkyl;

W, X, Y are the same or independently hydrogen, hydroxy, halogen, cyano, trifluoromethyl, carbamoyl, C_1–C_4 alkoxy, lower alkoxycarbonyl, N-lower alkylcarbanoyl, lower alkanoylamido, lowr alkanesulfonamido, lower alkylsulfonyl, sulfamoyl, lower alkanesulfamoyl, or N-lower alkylureido;

with the provisos that:

(a) only one of W, X and Y can be cyano or trifluoromethyl;

(b) only two of W, X and Y can simultaneously be hydroxy;

(c) at least one of W, X and Y is other than hydrogen; and

Z^- is a therapeutically acceptable anion.

28. The method for the treatment of cardiac arrhythmia in a mammalian subject which comprises administering to said subject an amount effective for the suppression of said arrhythmia of a compound according to claim **1**.

4,545,996

N-(4-ACETYLAMINOPHENACYL)AMINE DERIVATIVES USEFUL AS PHARMACEUTICALS

Louis Lafon, Paris, France, assignor to Laboratoire L. Lafon, France

Filed Oct. 12, 1984, Ser. No. 660,284

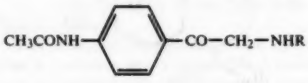
Claims priority, application France, Oct. 14, 1983, 83 16405

Int. Cl.[4] **C07C** *103/127*

U.S. Cl. 514—629 **6 Claims**

1. A N-(4-acetylaminophenacyl)amine derivative useful especially in therapy, which is selected from the group consisting of:

(i) the N-(4-acetylaminophenacyl)alkylamines corresponding to the general formula:



(I)

(in which R represents an isopropyl or tert.-butyl group), and

(ii) their addition salts.

4,545,997

PROCESS OF MANUFACTURING CANDY BARS CONTAINING WAFERS AND WAFER BARS MANUFACTURED THEREBY

Carl Y. Wong, Hummelstown; Mir N. Khan, Palmyra, and John A. Mihalik, Hershey, all of Pa., assignors to Hershey Foods Corporation, Hershey, Pa.

Continuation-in-part of Ser. No. 477,149, Mar. 21, 1983, abandoned. This application Sep. 11, 1984, Ser. No. 649,166

Int. Cl.[4] **A21D** *13/08;* **A23G** *3/00*

U.S. Cl. 426—94 **13 Claims**

1. A process for producing a chocolate enrobed creamed wafer candy bar comprising the steps of:

a. producing sheets of baked wafers;

b. cooling said sheets;

c. passing said cooled sheets through an in-line maturing tunnel in which the conditions are maintained at a temperature and dew point such that the moisture content of said sheets is increased to about 3.5 to about 6.0%;

d. maintaining a controlled environment room in which the temperature is held in the range from about 65° F. to about 80° F. and the relative humidity is held at or below about 30%;

e. passing said sheets out of said tunnel and into said controlled environment room;

f. forming a cream having a moisture content less than about 3.5% and less than the moisture content of said wafers;

g. applying a cream to said wafer sheets while inside said room and forming stacks of said coated wafer sheets while inside said room;

h. cutting said stacks into candy-size units; and

i. applying a chocolate coating to said candy-size units to produce a chocolate creamed wafer candy bar which is resistant to delamination of the chocolate coating.

4,545,998

MULTI-PHASE LIQUID SOLVENT DECAFFEINATION

Saul N. Katz, Monsey, N.Y., and Ronald H. Skiff, Harrison, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 30, 1980, Ser. No. 192,283
Int. Cl.[4] A23F *5/22*
U.S. Cl. 426—424 **1 Claim**

1. An improved method for decaffeinating an aqueous caffeine-containing solution wherein the aqueous solution is contacted with an extractant for a time sufficient for at least a portion of the caffeine to be extracted from the aqueous solution and taken up by the extractant, and the aqueous solution is separated from the extractant, wherein the improvement comprises: employing an extractant comprising a continuous phase of a liquid, water-immiscible, caffeine-specific solvent and a discontinuous aqueous phase dispersed therein, wherein the discontinuous aqueous phase of the extractant is saturated with all non-caffeine soluble solids present in the aqueous caffeine-containing solution.

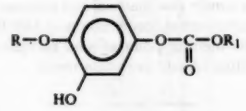
4,545,999

3-HYDROXY-4-METHOXYPHENYL ARYL CARBONATES

Jed A. Riemer, Scarsdale; Paul R. Zanno, Nanuet, and Ronald E. Barnett, Suffern, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,495
Int. Cl.[4] A23L *1/236*; C07C *69/96*
U.S. Cl. 426—548 **8 Claims**

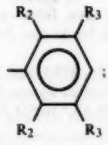
5. A foodstuff containing a compound of the formula:



wherein:

R is methyl;

R_1 is



each R_2 is selected from the group consisting of H, OH, CH_3, CH_2CH_3, OCH_3, CH_2OH, $CH_2CH_2CH_3$, $CH(OH)CH_3$, $CH(CH_3)_2$, OCH_2CH_3, CH_2OCH_3, CH_2CH_2OH, $COCH_3$, $COCH_2CH_3$, CH_2COCH_3, COOH and $COOCH_3$; and

each R_3 is selected from the group consisting of H, CH_3, CH_2CH_3, OCH_3;

with the proviso that R_1 contain no more than 12 carbon atoms; and salts thereof, said compound being present in an amount effective to perceive sweetness in said foodstuff.

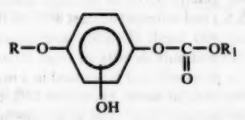
4,546,000

3-HYDROXY-4-ALKYLOXYPHENYL ALIPHATIC CARBONATES

Paul R. Zanno, Port Chester; Ronald E. Barnett, Suffern, and Jed A. Riemer, Scarsdale, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,496
Int. Cl.[4] A23L *1/236*; C07C *69/96*
U.S. Cl. 426—548 **12 Claims**

9. A foodstuff containing a compound of the formula:



wherein R is selected from the group consisting of methyl, ethyl, propyl; and R_1 is selected from the group consisting of alkyl, alkenyl; alkadienyl, cycloalkyl, cycloalkenyl cycloalkadienyl, bicycloalkyl and bicycloalkenyl, the total number of ring carbon atoms in said cycloalkyl, cycloalkenyl, cycloalkadienyl, bicycloalkyl and bicycloalkenyl being not greater than 7; and salt thereof; said compound being present in an amount effective to perceive sweetness in said foodstuff.

4,546,001

CANINE BISCUIT CONTAINING DISCRETE PARTICLES OF MEAT AND OTHER MATERIALS AND METHOD FOR MAKING SAME

Gary Gellman, Pomona, N.Y.; George A. Erfurt, Summit, and James E. Roe, Wayne, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Nov. 7, 1983, Ser. No. 549,352
The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—549 **30 Claims**

1. A method for making dry hard canine biscuits from a final biscuit dough comprising:

(a) dry blending particles, which contain (i) meat and/or meat by-product and (ii) farinaceous material and/or textured vegetable protein, and which have a moisture content of less than or equal to about 35 percent by weight of said particles, with non-fat solids to form a substantially homogeneous dry blended mixture, no fat being added in step (a) except for the indigenous fat which is present in said particles, said particles being present in an amount of about 3 to about 25 weight percent, based on the total weight of said dry hard canine biscuits and said particles having a water activity which is less than the water activity of said final biscuit dough;

(b) admixing water with said dry blended mixture (a) to form a first stage dough, said water being present in an amount of about 15 to about 35 weight percent, based on the total weight of the final biscuit dough;

(c) mixing an amount of added-fat with said first stage dough to form said final biscuit dough, said added-fat being present in an amount of about 0.5 to about 10 weight percent, based on the total weight of said final biscuit dough;

(d) forming said final biscuit dough into pieces using a low shear forming pressure of less than 75 p.s.i.g.; and

(e) baking and drying said pieces to form said dry hard biscuits, which are shelf stable and have said particles present as discrete visually-apparent particles distributed substantially uniformly throughout and embedded in the surface of said dry hard canine biscuits.

4,546,002

COLD-WATER-SOLUBLE GELATIN POWDERS

Richard R. Leshik, Ewing Township, Mercer County; Nancy A. Swallow, Plainsboro; Steven J. Leusner, Lakewood, and David J. DiGiovacchino, Hightstown, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 24, 1984, Ser. No. 583,461

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **9 Claims**

1. A powdered gelatin-containing dessert mix which is readily dispersible and soluble in water at a temperature of 50° F. which comprises:

(a) amorphous gelatin particles having a size of less than 230 mesh (U.S.S.) and wherein at least 80% of the particles are larger than 400 mesh (U.S.S.), said amorphous gelatin having a tamped bulk density of from 10 to 49 lbs/ft^3 and having been prepared and processed in a manner such that its moisture content never exceeded 10% by weight,

(b) cold-water-soluble food acid in an amount effective to produce a pH of from 2.7 to 3.7, said amount being effective to increase the set rate of the gelatin without causing precipitation of the gelatin;

(c) a salt in the amount of 2 to 15% by weight of gelatin;

(d) a sweetening agent; and

(e) mono and/or diglycerides in an amount of from 100 to 2000 ppm per part amorphous gelatin.

4,546,003

EDIBLE COMPOSITION COMPRISING DISCRETE FAT-BEARING PARTICLES IN A FAT-BEARING MATRIX

Henry J. Izzo, Bridgewater, and John P. McNaught, Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 402,710, Jul. 28, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,774

Int. Cl.[4] A23C *19/00, 19/09;* **A23D** *3/00*

U.S. Cl. 426—581 **24 Claims**

1. An edible, non-pourable plastic or semi-plastic composition comprising 0.1 to 80% by weight of discrete, fat-bearing particles selected from the group consisting of plastic, semi-plastic and liquid particles dispersed in a fat-bearing plastic or semi-plastic matrix, said matrix and said particles each comprising 10 to 100% by weight of fat, said particles having a size of about 0.04 mm to 10.0 mm and a Wiley mp less than 100° F.

4,546,004

METHOD OF PRODUCING LOW-GOSSYPOL COTTONSEED PROTEIN MATERIAL

Khee C. Rhee, College Station, and E. W. Lusas, Bryan, both of Tex., assignors to The Texas A&M University System, College Station, Tex.

Continuation of Ser. No. 456,439, Jan. 7, 1983, abandoned, which is a continuation of Ser. No. 230,451, Feb. 2, 1981, abandoned. This application Feb. 27, 1984, Ser. No. 583,284

Int. Cl.[4] A23J *3/00*

U.S. Cl. 426—656 **8 Claims**

1. The method of producing a substantially gossypol-free soluble protein food product from gossypol-containing cottonseed meal which comprises:

combining press cake or solvent-extracted cottonseed meal from gossypol-containing cottonseeds with at least about 3 times its volume of hydrochloric acid solution having a concentration approximately equal to or greater than one normal;

boiling said meal/acid combination, with reflux, at temperatures below about 150° C., for approximately 1 to 16 hours, until substantially all the gossypol has been destroyed;

thereafter, adding to the resultant acid protein hydrolyzate sufficient sodium hydroxide in a manner effective to neutalize the hydrolyzate to a pH of about 5.0 without forming gelatinous precipitate; and

separating this neutralized protein hydrolyzate from the insoluble residue.

4,546,005

METHOD FOR POURING CONFECTIONERY SOLUTION

Hermann-Otto Vongeheur, Neuwied, Fed. Rep. of Germany, assignor to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Apr. 12, 1983, Ser. No. 484,308

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217582

Int. Cl.[4] A23G *3/12, 3/00*

U.S. Cl. 426—660 **2 Claims**

1. A method of molding confectionary solution, comprising the step of pouring a confectionary solution into a mold while maintaining the atmosphere contacting the confectionary solution at a temperature at least substantially equal to the temperature of the confectionary solution and a moisture content at least substantially equal to the equilibrium moisture of the confectionary solution.

4,546,006

METHOD FOR STRENGTHENING PORCELAIN TOOTH

Koji Ohno, Tokyo; Nobukazu Ohi, Fuchu, and Syohei Hayashi, Tokyo, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Sep. 14, 1984, Ser. No. 650,543

Claims priority, application Japan, Jan. 26, 1984, 59-011035

Int. Cl.[4] C09K *3/00;* **A01N** *1/02*

U.S. Cl. 427—2 **4 Claims**

1. A method for strengthening porcelain tooth comprising depositing one or more inorganic salts of metals selected from rubidium, cesium, and potassium on the surface of a porcelain tooth obtained by sintering a dental porcelain material containing feldspar as a main raw material and sodium, and heat treating the porcelain tooth at temperatures of 380° C. or higher but lower than the melting point of said inorganic salt and the strain temperature of said porcelain tooth.

4,546,007

MULTI-LAYER COATING METHOD BASED ON SPECTRAL REFLECTANCE OF WHITE OR GRAY COLORS

Yoshiaki Abe, 12-352 Yuden, Iseda-cho, Uji-shi, Kyoto-fu, and Masaaki Koyama, 8-5, Ishiki-cho, 2-chome, Kariya-shi, Aichi-ken, both of Japan

Filed Sep. 26, 1983, Ser. No. 535,758

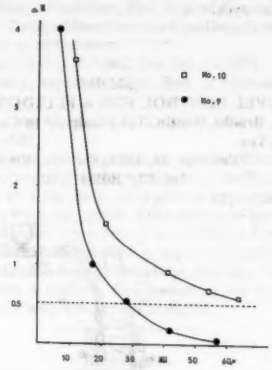
Claims priority, application Japan, May 21, 1983, 58-89604

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—8 **3 Claims**

1. In a method of forming a multi-layer coating comprising applying over an intercoat, a top coat under incomplete hiding conditions so as to produce a color very similar to that of a top coat applied at complete hiding, the improvement wherein the

intercoat color is selected from white or gray colors whose spectral reflectance comes as close as possible to the maximum



value of the spectral reflectance curve of the complete hiding top coat.

4,546,008

METHOD FOR FORMING A DEPOSITION FILM

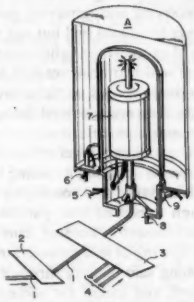
Keishi Saitoh, and Wataru Ando, both of Ibaraki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1984, Ser. No. 667,816

Claims priority, application Japan, Nov. 7, 1983, 58-208813; Nov. 7, 1983, 58-208814

Int. Cl.[4] B05D *3/06*

U.S. Cl. 427—38 **17 Claims**



1. A method for forming a deposition film on a substrate, which comprises applying an excitation energy to a silane compound (SiOA) in a gaseous state having at least 2 silicon atoms and at least one substituent (OA) of the formula of $-OC_aH_bX_c$, where $b+c=2a+1$, a is a positive integer, b and c are zero or a positive integer, provided that b and c are not simultaneously zero, and x is a halogen atom, to form a deposition film compound containing silicon atoms on the substrate.

4,546,009

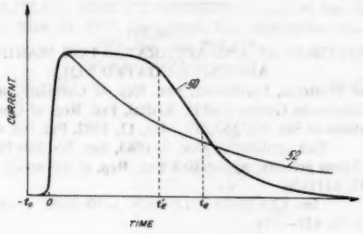
HIGH-MOBILITY AMORPHOUS SILICON DISPLAYING NON-DISPERSIVE TRANSPORT PROPERTIES

J. Thomas Tiedje, Garwood; Don L. Morel, Watchung, and Benjamin Abeles, Princeton, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 80,409, Oct. 1, 1979, abandoned. This application May 9, 1980, Ser. No. 148,403

Int. Cl.[4] B05D *5/12;* **H01L** *31/18*

U.S. Cl. 427—39 **11 Claims**



1. A method for producing an amorphous silicon semiconductor having nondispersive transport of majority carriers and further having a majority carrier mobility higher than about 0.6 cm^2/volt-second, said method comprising the steps of:

providing a substrate for deposition of said silicon thereon;

heating said substrate to a temperature between about 220° C. and about 350° C. in a vacuum chamber;

providing a partial pressure of silane in said chamber between about 800 millitorr and 850 millitorr;

sustaining a direct current glow discharge in the vicinity of said heated substrate at a current density between about 0.05 mA/cm^2 and about 0.3 mA/cm^2 for a period of time sufficient to deposit a layer of an amorphous silicon semiconductor on said substrate.

4,546,010

PROCESS FOR PRODUCING AN ELECTRICALLY CONDUCTIVE LAYER ON THE SURFACE OF A SOLID-BODY ELECTROLYTE, AND ELECTRICALLY CONDUCTIVE LAYER

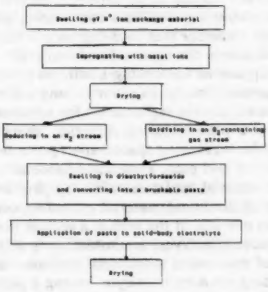
Eric Killer, Wettingen; Günther Scherer, Gebenstorf, and Samuel Stucki, Baden, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 9, 1984, Ser. No. 578,679

Claims priority, application Switzerland, Feb. 25, 1983, 1069/83

Int. Cl.[4] C25B *11/00*

U.S. Cl. 427—96 **7 Claims**


Swelling of n+ ion exchange material
Impregnating with metal ions
Drying
Reducing in an H_2 stream
Oxidizing in an O_2-containing gas stream
Reacting in dimethylformamide and converting into a brushable paste
Application of paste to solid-body electrolyte
Drying

1. A process for producing an electrically conductive layer

on the surface of a solid-body electrolyte (1) characterised in that an organic ion exchange material (2) is swollen in a liquid, is impregnated with a solution of metal ions, is dried, and is exposed to a reactive atmosphere in a gas stream at a temperature of 50° to 250° C., as a result of which the metal ions are converted into finely distributed particles (3) which are in electrical contact with one another, in that the ion exchange material (2) thus doped is swollen in an organic polar solvent, and is converted into a brushable paste which is applied to the surface of the solid-body electrolyte (1) by brushing or screen printing and dried.

4,546,011

METHOD OF AND APPARATUS FOR MAKING AN ADHESIVE-COATED ROLL

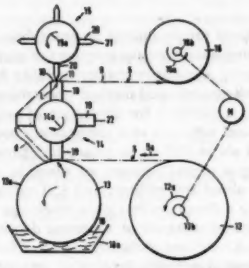
Emil Wolfrum, Forchheim, Fed. Rep. of Germany, assignor to Gebrauchs Gerate GmbH, Kriftel, Fed. Rep. of Germany

Division of Ser. No. 357,217, Mar. 11, 1982, Pat. No. 4,427,726. This application Dec. 7, 1983, Ser. No. 559,193

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111150

Int. Cl.[4] **B05D** *3/12, 5/08, 5/10;* **B05C** *1/16*

U.S. Cl. 427—179 **9 Claims**



1. A method of making adhesive-coated rolls, particularly rolls for cleaning garments or the like, comprising the steps of weakening spaced-apart portions of an elongated flexible web transversely of the longitudinal direction thereof so that the thus-weakened portions break in response to the application of tensional stresses thereto, and such weakened portions convert said web into a file of coherent neighboring sections each having a leader adjacent to the preceding weakened portion and a trailing portion adjacent to the next-following weakened portion; applying transversely extending layers to said leaders at a first side of said web, said layers consisting of a material which does not adhere to at least one adhesive, and one of said weakening and applying steps preceding the other; convoluting said web; and coating a second side of said web opposite said first side with said one adhesive prior to said convoluting step so as to obtain an adhesive-coated roll upon completion of said convoluting step, said convoluting step being performed in such a manner that said first side is the inner side and said second side is the outer side of said roll.

4. Apparatus for making a roll, particularly a roll for cleaning garments or the like, comprising a source of supply of an elongated flexible web; means for advancing the web lengthwise in a predetermined direction along an elongated path; means for weakening spaced-apart portions of the web in a first portion of said path; a source of hardenable adhesive-repellent liquid material; and means for applying longitudinally spaced layers of the liquid material extending completely across the web to one side of the web in a section portion of said path so that successive layers are immediately adjacent to at least one side of successive weakened portions, said applying means including a rotary conveyor having a peripheral surface, and engaging means for contacting spaced-apart portions of the one side of the running web with said peripheral surface, said conveyor being mounted in such a manner that a portion of said peripheral surface projects into said source of liquid material so that the latter coats, and is conveyed to the region of said engaging means on, said peripheral surface during rotation of said conveyor.

4,546,012

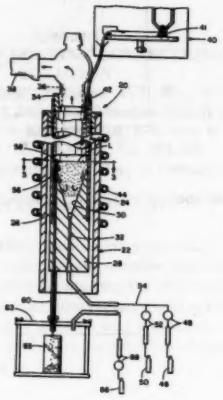
LEVEL CONTROL FOR A FLUIDIZED BED

Lionel H. Brooks, Austin, Tex., assignor to Carbomedics, Inc., Austin, Tex.

Filed Apr. 26, 1984, Ser. No. 604,028

Int. Cl.[4] **B05D** *7/00*

U.S. Cl. 427—213 **10 Claims**



1. Fluidized bed apparatus for use in applying a coating, having a relatively lesser density, to particles, having relatively greater densities, by causing passage of a gaseous atmosphere through a bed of said particles, said apparatus comprising:

an enclosure for holding a bed of said particles;

means for causing flow of said gaseous atmosphere carrying a material for forming said coating upward through said bed of particles to fluidize said particles; and

a weir tube defined by a sidewall and having a spillover entrance hole for defining a maximum particle level for said bed by receiving and removing particles having substantial coatings from said bed but not removing substantial quantities of uncoated or lightly coated particles when the contents of said bed achieves said level, whereby the relatively less dense coated particles levitate to the top of said bed where they are removed from said bed through said weir tube entrance hole.

9. A method of providing level control in fluidized bed apparatus of the type for applying a coating to particles having greater densities than that of said coating by flowing a gaseous atmosphere through a bed of said particles, said apparatus comprising an enclosure for holding said bed of particles, means for causing flowing of said gaseous atmosphere carrying a material for forming said coating through said bed of particles to fluidize them, and means for adding seed particles to said bed; said level control method comprising:

(a) providing a substantially vertical weir tube so it extends through a portion of said bed and thereabove adjacent a side of said bed;

(b) providing a spillover hole in a sidewall of said tube extending through said sidewall and disposed to define a predetermined level of said bed;

(c) positioning said hole angularly so that it faces away from a central portion of said bed; and

(d) covering the upper end of said tube.

4,546,013
METHOD OF, AND APPARATUS FOR, MOISTENING LOOSE MATERIAL

Wilhelm Schlüter, Altenbeken, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbau-Gesellschaft mbH, Paderborn, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,679

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137109

Int. Cl.⁴ B32B *5/02*; B05D *3/02*

U.S. Cl. 427—220 **4 Claims**

1. A method of applying glue to a loose fibrous material which is revolved relatively rapidly in a confined space by causing glue to flow in a substantially unpressurized state approximately from the centre of the space and breaking down the glue into droplets by means of a centrifugal force, wherein air under slight excess pressure is supplied together with the glue to cause further breakdown of the glue into finer droplets and to establish a uniform distribution of the finer droplets prior to contact with the fibrous material.

4,546,014
WATER-SWELLABLE CROSSLINKED POLYMERIC MICROGEL PARTICLES AND AQUEOUS DISPERSIONS OF ORGANIC FILM-FORMING RESINS CONTAINING THE SAME

Chandrasen Gajria, Louisville, Ky., and Yehuda Ozari, Arcadia, Calif., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 449,887, Dec. 16, 1982, abandoned. This application Jan. 18, 1985, Ser. No. 692,477

Int. Cl.⁴ B05Z *7/22*

U.S. Cl. 427—239 **2 Claims**

1. A method of protecting the surface of an article of manufacture which comprises applying a coating of a stable aqueous dispersion to the surface of the article, and then heat-treating the coating to form an adherent thermoset film on the surface of the article wherein the stable aqueous dispersion is comprised of

a. at least one water-dispersible, film-forming resin dissolved in an organic water-miscible solvent wherein the film-forming resin is selected from the group consisting of heat-curable, thermosetting epoxy resins, phenolic resins, alkyd resins, polyester resins, aminoplast resins and mixtures thereof and wherein the organic solvent has a boiling point of about 150° F. to about 500° F.;

b. a dispersing amount of an aqueous solvent medium; and

c. from about 10 to 50% by weight, based on the total solids weight of the dispersion, of a stabilizer for stabilizing said film-forming resin in said aqueous solvent medium, said stabilizer comprising crosslinked, aqueous emulsion polymerized microgel particles comprising the addition copolymerization product of:

(i) a major amount of at least one polymerizable carboxylic acid group-free polymerizable vinyl monomer selected from the group consisting of polymerizable vinyl aromatic monomers, methacrylate ester monomers, nitrile monomers, vinyl halide monomers, mixtures thereof, and mixtures thereof with minor amounts of vinyl ester monomers and alkyd acrylate monomers,

(ii) from about 10–50%, based on the total monomer weight of at least one polymerizable vinyl monomer selected from the group consisting of α,β-ethylenically unsaturated carboxylic acid monomers and mixtures thereof, said carboxylic acid monomers being substantially non-gelling when copolymerized with said acid group-free monomers in an aqueous emulsion, and

(iii) from a small amount sufficient to crosslink the microgel particle up to about 5%, based on the total monomer weight, of a difunctional crosslinking monomer having at least two polymerizable double bonds,

said microgel particles being water-swellable, exhibiting a stability in aqueous media of at least about one week when an aqueous dispersion of said microgel particles of about 20% solids content is maintained at 140° F., and having further the acid groups thereof at least partially neutralized with ammonia or a volatile organic amine in an amount sufficient to provide a pH of about 2 to about 10 to said aqueous dispersion.

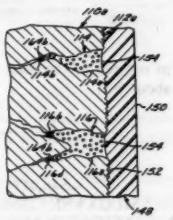
4,546,015
CORROSION PROTECTION METHOD

Roger Lovell, P.O. Box 760, Palacios, Tex. 77465

Division of Ser. No. 218,082, Dec. 19, 1980, Pat. No. 4,452,856, which is a continuation-in-part of Ser. No. 587, Jan. 2, 1979, Pat. No. 4,275,111, which is a continuation-in-part of Ser. No. 783,467, Mar. 31, 1977, abandoned. This application Mar. 28, 1984, Ser. No. 594,125

Int. Cl.⁴ B05D *3/12, 7/14*

U.S. Cl. 427—247 **35 Claims**



1. A method of providing corrosion protection to a metal body having outer surface means and pore means communicating with said outer surface means, which pore means has small inner channel portions, said method comprising the steps of:

introducing inner protective material into said pore means, said inner material comprising a liquid medium that is substantially impervious to atmospheric corrosive agents and a suspension of finely divided particulate material in said liquid medium,

removing from said outer surface means substantially all of said inner material that may remain thereon after said introducing step while leaving web means of said inner material extending across outer portions of said pore means proximate the region where said pore means communicates with said outer surface means,

moving some of said particulate material inwardly relative to said liquid medium of said web means so as to substantially seal off with particulate material the small inner channel portions of said pore means to substantially prevent movement of said inner material into the substantially sealed off small inner channel portions and thereby stabilize the location of said web means proximate said region, and

applying a covering of outer protective material over said outer surface means and said pore means, said outer material being different from said liquid medium and being substantially impervious to atmospheric corrosive agents and to said inner material, said outer covering being applied so as to form an intimate bond with said outer surface means and bridge over said pore means.

4,546,016
DEPOSITION OF BOROPHOSPHOSILICATE GLASS

Werner Kern, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

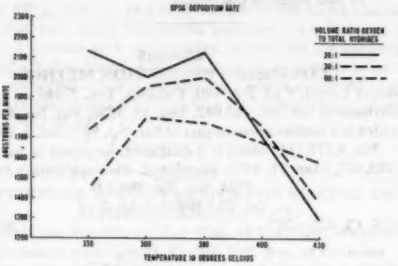
Filed Aug. 6, 1984, Ser. No. 636,832

Int. Cl.⁴ C23C *11/00, 13/00*

U.S. Cl. 427—255.3 **7 Claims**

1. In a method for forming a layer of borophosphosilicate glass on a suitable substrate by chemical vapor deposition of a mixture of oxygen and the hydrides of silicon, boron and phos-

phorus, the improvement wherein the deposition is carried out at a temperature of from about 365° to about 375° C., and the



volume ratio of oxygen to the total of said hydrides is from about 40:1 to about 60:1.

4,546,017

ORGANOPOLYSILOXANE COMPOSITION CURABLE TO AN ELASTOMER AND USE THEREOF

Dale R. Flackett, Wiesbaden; Reinhard Jonas, Edstein, both, Fed. Rep. of Germany, and Brian R. Trego, Bossem, Belgium, assignors to Dow Corning Limted, London, England and Perennatorwerk Alfred Hagen GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Jan. 11, 1985, Ser. No. 690,922

Claims priority, application United Kingdom, Jan. 14, 1984, 8401016

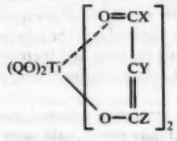
Int. Cl.⁴ B05D *3/02*

U.S. Cl. 427—387 **11 Claims**

1. A composition curable to an elastomer in the presence of moisture and comprising the product obtained by mixing

(A) 100 parts by weight of a polydiorganosiloxane having terminal silicon-bonded hydroxyl groups and wherein at least 50 percent of the total organic substituents are methyl,

(B) from 2 to 20 parts by weight of a complex of titanium represented by the general formula



wherein each Q is a group having from 2 to 6 carbon atoms per group which is selected from hydrocarbon groups and groups composed of carbon, hydrogen, and oxygen in the form of ether linkages, each X and Z is an alkyl group having from 1 to 4 inclusive carbon atoms per group, and each Y is a hydrogen atom or an alkyl group having from 1 to 4 inclusive carbon atoms per group, and

(C) from 3.3 to 33.3 parts by weight of one or more oxime silanes of the general formula

$$R_{4-n}Si(ON{=}CR'_2)_n$$

wherein each R is a monovalent group selected from alkyl groups having less than 6 carbon atoms, vinyl, allyl, and phenyl, each R' is a monovalent group selected from alkyl groups having from 1 to 6 inclusive carbon atoms and phenyl, and n has an average value of from 2.1 to 3.

4,546,018

COATING COMPOSITION AND PRIMER

Mikami Ryuzo, and Katsuyoshi Nakasuji, both of Ichihara, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 539,596, Oct. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 399,606, Jul. 19, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 684,183

Claims priority, application Japan, Sep. 21, 1981, 56-149107

Int. Cl.⁴ B65B *55/00*

U.S. Cl. 427—407.2 **21 Claims**

1. A method of bonding a room temperature curable rubber coating to a solid substrate which comprises

(I) contacting a solid substrate with a room temperature curable primer composition comprising

(A) 100 parts by weight of a silicone modified epoxy resin which contains both epoxy groups and silicon-bonded alkoxy groups wherein the modified epoxy resin is obtained by contacting and reacting

(a) a compound having the unit formula

$$R_aSiX_bO_{\frac{(4-a-b)}{2}}$$

wherein R is a substituted or unsubstituted monovalent hydrocarbon radical, X is an alkoxy radical having the formula R'O— wherein R' is an alkyl radical of 1 to 4 carbon atoms or the radical R^2OR^3— wherein R^2 is an alkyl radical of 1 to 4 carbon atoms and R^3 is a divalent alkylene radical of 1 to 3 carbon atoms; a has a value of 0 to 2; b has a value of 1 to 4 and the sum of a+b has a value of 1 to 4, with

(b) an epoxy resin containing at least one epoxy group and at least one hydroxy group per molecule; and

(B) 0.1 to 100 parts by weight of an organotitanium acid ester, and

(II) allowing said primer to air dry

(III) surmounting the air dried primer with a room temperature curable rubber, and

(IV) allowing the room temperature curable rubber to cure whereby the room temperature curable rubber is bonded to the solid substrate.

4,546,019

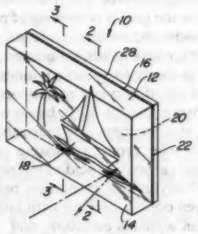
WORKS OF VISUAL AND SCULPTURAL ART AND METHODS OF MAKING THEM

Donna Schneider, c/o South Seas Specialities, 875 Waimanu St., No. 516, Honolulu, Hi. 96813

Filed May 21, 1984, Ser. No. 612,736

Int. Cl.⁴ B44C *3/06;* **B44F** *1/04*

U.S. Cl. 428—13 **6 Claims**



1. A work of visual and sculptural art comprising a generally transparent substrate having front and rear surfaces thereon, an image cut into said rear surface of said substrate and visible upon viewing said front surface, and a light-reflective layer disposed on said rear surface and covering at least those areas of said rear surface not affected by said image, said light-reflec-

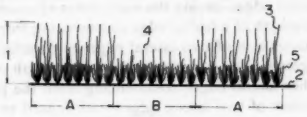
tive layer being so disposed as to reflect incident light toward and through said front surface, said light-reflective surface being a mirror, and said image being an intaglio image projecting through said mirror and interrupting said light-reflective layer, and means associated with said intaglio image for coloring at least a portion of said image, said means for coloring comprising colored film means coupled to said rear surface and disposed behind the said portion of the intaglio image.

4,546,020

ARTIFICIAL FUR WITH GUARD HAIR FIBERS AND UNDER FUR FIBERS

Masaaki Sakai; Kenji Sato, and Seiichi Yamagata, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 1, 1984, Ser. No. 656,512
Int. Cl.⁴ A01N *1/00*
U.S. Cl. 428—16 **4 Claims**



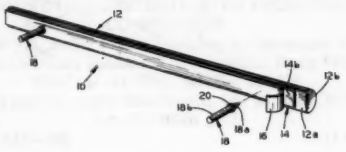
1. In an artificial fur composed of a warp pile fabric comprising a ground construction and pile yarns fixed to the ground construction and present in the form of fiber bundles within the ground construction, said pile yarns being composed of guard hair fibers and under fur fibers, the constituent fibers in the pile portion being opened and raised and the guard hair fibers of the pile yarns having the top ends thereof tapered, and improvement wherein plural kinds of the fibers of pile yarns differing in at least one of the fineness, color, thickness, and length of fiber are used in at least guard hair fibers and a stripe pattern is manifested on the surface of the pile with the rising hair density of the guard hair fibers being at least 500 fibers per cm^2.

4,546,021

VEHICLE TRIM STRIP STRUCTURE

Lawrence N. Mears, Solon, Ohio, assignor to Lof Plastics Inc., Troy, Mich.

Filed Aug. 13, 1984, Ser. No. 639,725
Int. Cl.⁴ B60R *13/04*
U.S. Cl. 428—31 **13 Claims**



1. A trim strip structure for attachment to a vehicle comprising:

an elongate molding;

one or more elongate double-faced adhesive tape strips in total extending substantially the entire length of said molding, each of said tape strips having one face secured to said molding and having a detachable backing strip applied to the opposite face; and

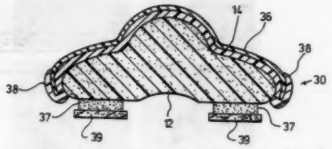
at least one stud member secured to said molding, said stud member having one end provided with a threaded section extending through at least one of said tape strips and into said molding, and an opposite end extending outwardly from said molding and adapted to receive a fastening means.

4,546,022

COMPOSITE MOLDING SYSTEM

Ciro Madonia, 147 Mississauga Rd. North, Mississauga, Ontario; Christopher Hatzikelis, R.R. #2, Palgrave, Ontario, and Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, all of Canada

Continuation of Ser. No. 294,403, Aug. 19, 1981, abandoned.
This application Dec. 20, 1983, Ser. No. 563,650
Int. Cl.⁴ B60R *13/04*
U.S. Cl. 428—31 **19 Claims**



1. An elongated non-metallic continuous decorative impact cushioning molding suited for attachment to the sides of vehicles consisting of:

(a) an extruded solid base section of pliable foamed plastic material having a predetermined imperforate cross-section of reclaimed plastic possessing colour residues therein, with a curved outer surface and a substantially flat under surface having an adhesive mounting strip attached thereto and;

(b) a decorative and protective non-blown plastic skin layer portion incorporating decorative pigmentation applied as a preformed thin skin in bonded adherent relation to, and covering the whole of said outer surface of the base section in protective and concealing decorative relation therewith to form a unitary molding.

4,546,023

SMOKE-PERMEABLE FILM OF FIBER-REINFORCED REGENERATED CELLULOSE FOR PRODUCING TUBULAR CASINGS, IN PARTICULAR SAUSAGE CASINGS

Erna Kastl, Taunusstein; Klenk Ludwig, Oestrich-Winkel, and Horst Faust, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 1, 1984, Ser. No. 636,495
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1983, 3328050
Int. Cl.⁴ F16L *11/00*; A22C *13/00*
U.S. Cl. 428—36 **36 Claims**

1. A smoke-permeable film suitable for the production of tubular casings, in particular sausage casings, comprising:

a. a film of fiber-reinforced regenerated cellulose; and

b. a layer of a thermoplastic sealable resin, comprising a vinylidene group-containing copolymer having a smoke-permeable structure and being anchored to the surface of said cellulose film with the aid of an adhesion promoting layer, wherein said resin layer completely coats at least one of the two surfaces of said cellulose film, and wherein said smoke-permeable structure comprises linear discontinuities running parallel to one another, wherein said discontinuities have lengths of from about 5 to 1000 μm, widths of from about 2 to 15 μm, and depths of from about 3 to 15 μm.

4,546,024

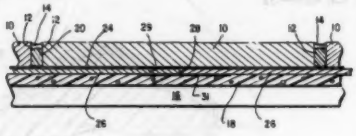
MODULAR-ACCESSIBLE-TILES PROVIDING ACCESSIBILITY TO CONDUCTORS AND PIPING WITH IMPROVED SOUND ISOLATION

J. Gale Brown, 1128 Greenleaf Ave., Wilmette, Ill. 60091

Continuation-in-part of Ser. No. 131,516, Mar. 18, 1980, abandoned. This application Jun. 24, 1982, Ser. No. 391,760

Int. Cl.⁴ B32B *3/10;* **E04F** *13/08*

U.S. Cl. 428—44 **72 Claims**



1. An array of gravity-held-in-place-load-bearing-horizontal-tiles, comprising, in combination, a resilient substrate and a plurality of horizontal-individual-tiles of uniform thickness having a top wearing surface, a bottom surface and three or more sides, loose laid over said resilient substrate, said tiles being arranged in a patterned layout and joined one to another by means of a dynamic-interactive-fluidtight-flexible joint for assembling and holding the assembly in place by gravity, friction, and accumulated-interactive-assemblage over said resilient substrate so that said assembly is cushioned by said resilient substrate and responds dynamically to foot and rolling traffic, said dynamic-interactive-fluidtight-flexible-joint comprising a bottom layer of gun-grade elastomeric sealant and a top layer of self-leveling elastomeric sealant, said dynamic-interactive-fluidtight-flexible-joint comprising an adhesion zone whereby said elastomeric sealant is adhered to all perimeter sides of said horizontal-individual-tiles and a cohesion zone joins together said adjacent adhesion zones of all said adjacent perimeter sides of said horizontal-individual-tiles, said array of horizontal-individual-tiles being loose laid over said resilient substrate.

4,546,025

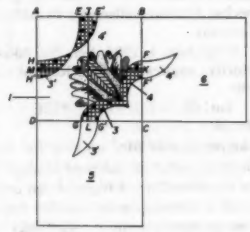
MULTI-LATERAL EDGE UNIT HAVING AN ASYMMETRICAL DESIGN THAT EXTENDS TO THE LATERAL EDGES

Jakov Vaisman, 2980 W. 28th St., Brooklyn, N.Y. 11224

Continuation of Ser. No. 183,463, Sep. 2, 1980, abandoned, and continuation of Ser. No. 878,350, Feb. 16, 1978, abandoned. This application Mar. 12, 1984, Ser. No. 588,437

Int. Cl.⁴ B44C *1/28*

U.S. Cl. 428—47 **21 Claims**



1. A decorative unit comprising:

(a) A design positioned on a planar surface of said unit whose border is defined by four lateral edges of equal length or multiples thereof to enclose a rectangular configuration or defined by six lateral edges to enclose a regular hexagonal configuration;

(b) the design being asymmetrically disposed within said configuration with respect to the geometric center thereof;

(c) at least one portion of said design terminating with an edge segment disposed on a lateral edge and all the lateral edges having at least one edge segment;

(d) all the edge segments disposed on the lateral edges the same distance from the nearest point of intersection of two lateral edges being of equal width;

(e) said at least one edge segment being disposed on a lateral edge with the proviso that if an odd number of edge segments are disposed on a lateral edge then one edge segment is disposed on and symmetrically disposed about the midpoint of said lateral edge and if an even number of edge segments are disposed on a lateral edge then each edge segment of a pair are disposed the same distance from the midpoint of the lateral edge;

(f) the area proximal each edge segment disposed the same distance from the nearest point of intersection of two lateral edges having the same color characteristics;

(g) a length of a lateral edge commencing from the point of intersection of two lateral edges and including one edge segment being identical to an equal length on each of the other lateral edges commencing from the point of intersection of two lateral edges with regard to the location, width, number and color characteristic of the edge segment disposed thereon; and

(h) said decorative unit being adapted to mate with any side of a lateral edge of an identical decorative unit whereupon the joint edge segments can form a variety of continuous distinctive patterns without disruption of the color characteristics between said joint edge segments.

4,546,026

SIMULATED CASHMERE FABRIC AND METHOD

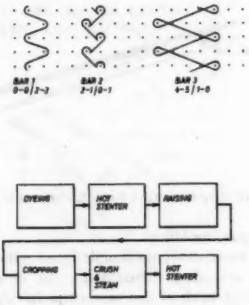
Michael S. Kowalski, Stanely, England, assignor to Guilford Kapwood Limited, Derbyshire, England

Filed Dec. 5, 1983, Ser. No. 558,298

Claims priority, application United Kingdom, Dec. 3, 1982, 8234472

Int. Cl.⁴ D04B *23/06, 23/08;* **D06C** *13/08, 27/00*

U.S. Cl. 428—91 **19 Claims**



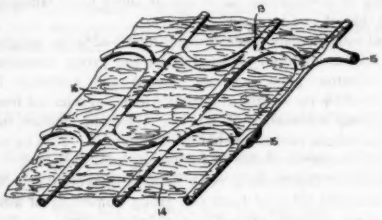
1. A simulated cashmere fabric comprising a warp-knit ground comprising a stretch yarn and a raised and cropped face.

15. A method for making simulated cashmere fabric comprising warp-knitting a ground fabric from a stretch yarn together with a face yarn and raising and cropping the face yarn.

4,546,027
NON-WOVEN MATERIAL FOR MEDICAL COMPRESSES

Marcel Holvoet, Louviers, and Bernard Picard, Amfreville la Campagne, both of France, assignors to Beghin-Say S.A., Thumeries, France

PCT No. PCT/FR82/00211, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/02630, PCT Pub. Date Aug. 4, 1983
PCT Filed Dec. 16, 1982, Ser. No. 545,383
Claims priority, application France, Jan. 29, 1982, 82 01392
Int. Cl.[4] A61F *13/00, 15/01;* D04H *5/06, 5/08*
U.S. Cl. 428—109 12 Claims

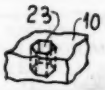


1. Non-woven material for a medical or surgical compress having a machining direction and a crosswise direction, characterized in that it has a succession of waves uniformly distributed along the lines parallel to the machining direction and whose adjacent anti-nodes are alternatively located above and below the median plane of said non-woven material and in that it comprises a synthetic netting having a cellulose fiber web thermobonded to one of its faces.

4,546,028
COMPOSITE SUBSTRATE WITH HIGH HEAT CONDUCTION

Christian Val, Paris, France, assignor to Compagnie d'Informatique Militaire Spatiale & Aeronautique, Paris, France

Filed Apr. 21, 1983, Ser. No. 487,153
Claims priority, application France, Apr. 27, 1982, 82 07256
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 11 Claims

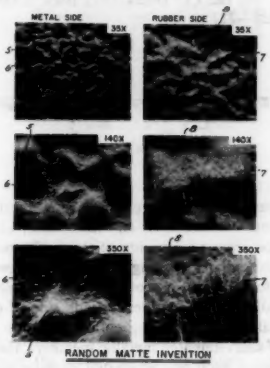


1. A composite base for an integrated circuit, comprising: a substrate, of an electrically insulating, ceramic material, having a first surface and a second surface essentially parallel to said first surface, said first surface to be connected to an integrated circuit; a plurality of first openings extending from said first surface towards said second surface but ending short thereof; and a plurality of first metal cells filling said openings.

4,546,029
RANDOM EMBOSSED MATTE PLASTIC FILM

Leopoldo V. Cancio, and Pai-Chuan Wu, both of Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Filed Jun. 18, 1984, Ser. No. 621,558
Int. Cl.[4] B32B *1/00, 3/30*
U.S. Cl. 428—141 7 Claims



1. An embossed thermoplastic film having a random embossed matte pattern which is undetectible to the unaided eye and imparts a visibly dull surface to both sides of the film, said film having a thickness of about 0.5 to about 1.5 mils and an embossed depth of about 0.4 to about 2 mils wherein the random pattern comprises a series of asymmetric raised bosses and asymmetric depressions to provide an overall random network on one side of the film, wherein said random pattern of asymmetric bosses and depressions overlie on the opposite side of said film corresponding asymmetric depressions and asymmetric bosses.

4,546,030
POLYETHYLENE TEREPHTHALATE FILM, PROCESS FOR THE PRODUCTION THEREOF AND MAGNETIC RECORDING MEDIUM THEREFROM

Satoyuki Minami; Kazuhiro Tanaka, and Takeshi Nishioka, all of Ohtsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 425,960, Sep. 28, 1982, Pat. No. 4,497,865. This application Sep. 26, 1984, Ser. No. 654,599
Claims priority, application Japan, Feb. 17, 1982, 57-22593; Mar. 5, 1982, 57-33801
Int. Cl.[4] B32B *4/36;* G11B *5/68*
U.S. Cl. 428—220 8 Claims

1. A polyethylene terephthalate film having the sum of F-5 valves in longitudinal and transverse directions of 3500 to 5000 kg/cm^2, absolute coefficients of heat shrinkage in longitudinal and transverse directions at 100° C. of up to 2.5% and an amorphous orientation factor of −1.5 to 0.5,

said film being obtained by subjecting a polyethylene terephthalate sheet to multi-stage longitudinal stretching, transverse stretching and biaxial restretching, wherein the total stretching ratio is at least 27.

4,546,031

REINFORCING ELEMENT FOR ELASTOMERIC ARTICLES AND ELASTOMERIC MADE THEREOF

Jimmy L. Richards, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 523,304, Aug. 15, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 699,274

Int. Cl.⁴ D02G *3/00*; B60C *5/00*

U.S. Cl. 428—222 **8 Claims**

1. An elastomeric article comprising a plurality of reinforcing elements embedded in an elastomeric, each reinforcing element comprising a plurality of elongated metallic members having substantially rectangular cross sections, of identical width the longitudinal axes of said elongated metallic members being parallel to one another, a wide side of each said elongated metallic member being contiguous with a wide side of another of said elongated metallic members, the ratio of width to thickness of each said elongated metallic member being at least 2 to 1, but no greater that 10 to 1, and a single wrap member helically disposed around said elongated metallic members such that each turn of said wrap member is spaced apart from the next adjacent turns of said wrap member a distance, as measured in a direction parallel to the longitudinal axes of said elongated metallic members, that is at least equal to the width of one of said elongated metallic members.

4,546,032

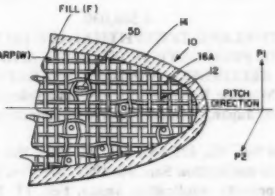
FIBER REINFORCED CARBON/CARBON COMPOSITE STRUCTURE WITH TAILORED DIRECTIONAL SHEAR STRENGTH PROPERTIES

Thomas Vasilos, Winthrop, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,369

Int. Cl.⁴ B32B *7/08*

U.S. Cl. 428—223 **6 Claims**



1. An improved fiber composite article with tailored multidirectional shear strength comprising a repetitive array of means defining a first planar fabric layer including a plurality of elongate flexible warp direction fibers in a zero degree orientation woven with orthogonal fill fibers, means defining a second planar fabric layer, adjacent to the first, with its warp and fill directions offset from those of the first layer, means defining an array of third dimension fibers essentially perpendicular to the plane of the fabric layers piercing the fabric layers, and means defining a matrix impregnated throughout the array.

4,546,033

GASKET SHEET

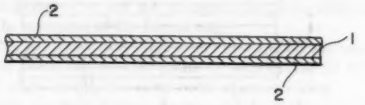
Yasushi Tsuchimoto; Shiro Takahata; Kiyotaka Shimada, all of Nara; Koji Tanaka, Okayama; Susumu Aoki, Yokohama; Tsutomu Yamamoto, Yokohama; Masaaki Ashizawa, Yokohama, and Kazuo Nishimoto, Yokohama, all of Japan, assignors to Nichias Corporation, Tokyo and Japan Exlan Company, Ltd., Osaka, both of, Japan

Division of Ser. No. 359,905, Mar. 19, 1982, abandoned. This application Jan. 25, 1984, Ser. No. 573,804

Claims priority, application Japan, Mar. 19, 1981, 56-40153; May 26, 1981, 56-79762

Int. Cl.⁴ C09K *3/10*; F16J *15/10*

U.S. Cl. 428—290 **13 Claims**



1. A molded and vulcanized three-layer gasket sheet comprising an intermediate layer and an outer layer laminated on each side of said intermediate layer,

said intermediate layer comprising 50–85% by weight of a fibrous material selected from the group consisting of asbestos, glass, carbon, phenol and cellulose fibers, 10–50% by weight of a rubber material selected from the group consisting of styrene butadiene rubber, nitrile-butadiene rubber and natural rubber and 1–23% by weight of a water-insoluble and -swelling substance, and

said outer layers comprising 50–85% by weight of a fibrous material selected from the group consisting of asbestos, glass, carbon, phenol and cellulose fibers, 10–50% by weight of a rubber material selected from the group consisting of styrene butadiene rubber, nitrile-butadiene rubber and natural rubber and 1–38% by weight of a water-insoluble and -swelling material.

4,546,034

METAL CATALYZED PREPARATION OF POLYOXYALKYLENE SURFACTANTS FOR PHENOLIC FOAM STABILIZATION

Richard L. Frentzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 649,042, Sep. 10, 1984, which is a division of Ser. No. 585,703, Mar. 2, 1984, Pat. No. 4,490,489, which is a division of Ser. No. 319,868, Nov. 9, 1981, Pat. No. 4,438,018, which is a continuation of Ser. No. 113,841, Jan. 21, 1980, abandoned. This application Mar. 18, 1985, Ser. No. 713,357

Int. Cl.⁴ B32B *3/26*

U.S. Cl. 428—318.4 **19 Claims**

1. A laminated structural panel having at least one facing sheet and having a foam material adhering to the facing sheet wherein the foam material comprises the reaction product of:

A. phenol-aldehyde resin foam forming reactants,

B. a blowing agent, and

C. a surfactant which is the product of a free radical addition polymerization of a cyclic nitrogenous vinyl monomer

and an esterified unsaturated dibasic acid in the presence of (a) a polyoxyalkylene adduct having the formula

$$H(\text{polyoxyalkylene chain})_tR,$$

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, (b) an organic or inorganic per-compound, and (c) a metal catalyst selected from the group consisting of ferrocene, acetylferrocene, benzoylferrocene, cobaltocene, 1,1'-diacetylferrocene, 1,1'-ferrocenebis-(diphenyl-phosphine), nickelocene, hafnocene dichloride, ferrocenecarboxaldehyde, mixtures of said ferrocene compounds and other transition metal compounds containing a metal having an atomic number of 21 to 30, and a mixture of compounds selected from the group consisting of iron (II) sulfate and iron (III) sulfate, iron (II) sulfate and iron (III) chloride, manganese (II) acetylacetonate and manganese (III) acetylacetonate, cobalt (II) benzoate and cobalt (III) acetylacetonate, copper (I) acetate and copper (II) acetyl-acetonate, and vanadium (III) acetylacetonate and vanadium (IV) oxide acetylacetonate, said polyoxyalkylene adduct optionally being treated either before or after said polymerization with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50, and the major component of said surfactant comprising the product formed from the reaction of said cyclic nitrogenous vinyl monomer and unsaturated diester onto said polyoxyalkylene adduct.

4,546,035

POLYMERIC ADDITIVES FOR MAGNETIC COATING MATERIALS

Ming Ko; Michael E. Oxsen, and Robert B. Prime, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,300
Int. Cl.[4] G11B *5/72*
U.S. Cl. 428—315.9 **3 Claims**

1. In a magnetic recording element having a substrate and a cured magnetic coating on said substrate, wherein said magnetic coating contains microvoids and, coated on the magnetic coating or layer containing said microvoids, a lubricant, wherein said coating being applied to the substrate in the form of a liquid comprising magnetic particles dispersed in a curable binder, said lubricant being applied to the cured surface of said magnetic coating, the improvement comprising a polymeric additive in said coating composition at a concentration from 0.5% to 5% by weight of said magnetic particles wherein said additive is thermally degradable during said curing of said magnetic coating wherein said curing occurs prior to the application of the lubricant to the surface of said magnetic coating, said polymeric additive being selected from the group consisting of Polybutene, Acrylonitrite-methyl methacrylate copolymers, Maleic anhydride-methyl methacrylate copolymers, Poly(ethylene oxide) Polyformaldehyde, Poly(γ-methylstyrene), Poly(styrene-methyl methacrylate), Poly(methyl methacrylate), Polysulfones, Poly(vinyl acetate), Low molecular weight polyethylene, and polypropylene.

4,546,036

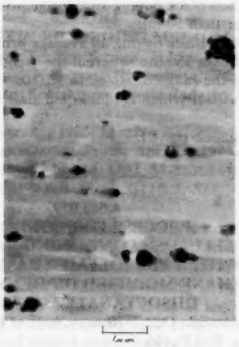
MAGNETIC RECORDING MEDIUM HAVING OPAQUE POLYESTER FILM BASE

Brenda L. Renalls, St. Paul, Minn.; Douglas G. Pedrotty, Baldwin, Wis., and John F. Donlan, West St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 22, 1983, Ser. No. 565,016
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—323 **11 Claims**

1. Magnetic recording medium comprising a biaxially-oriented single- or multi-layer polyester film base and at least one magnetic recording surface layer there being finely divided carbon black uniformly dispersed throughout at least one layer of the film base to provide opacity, wherein the improvement comprises:

the carbon black comprises from 0.1 to 3% by weight of the film base and is in the form of beads having a median



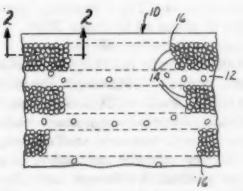
diameter from 50 to 500 nm, and when viewed at 75× magnification, the surface of the film base is substantially free from distinct peaks much as would be present if the film base contained beads or agglomerates exceeding 5 micrometers in diameter.

4,546,037

FLEXIBLE TAPE HAVING STRIPES OF ELECTRICALLY CONDUCTIVE PARTICLES FOR MAKING MULTIPLE CONNECTIONS

Timothy W. King, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 4, 1984, Ser. No. 646,824
Int. Cl.[4] B32B *3/00, 15/00*
U.S. Cl. 428—323 **13 Claims**



1. Flexible tape for making multiple electrical connections comprising a layer containing electrically conductive particles embedded in a polymeric dielectric matrix within an orderly pattern of nonintersecting stripes, each of the particles having a ferromagnetic core and an electrically conductive surface, the maximum thickness of substantially every particle being less than the thickness of the layer, the particles in each stripe contacting each other in continuous array so that each stripe is electrically conductive over both its length and thickness.

4,546,038

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Masaaki Fujiyama; Katsumi Ryoke, and Eiichi Tadokoro, all of Kanagawa, Japan, assignors to Fuji Photo Film Company, Limited, Japan

Filed Apr. 29, 1983, Ser. No. 489,908
Claims priority, application Japan, Apr. 30, 1982, 57-72914
Int. Cl.[4] B32B *5/16*
U.S. Cl. 428—323 **17 Claims**

1. A magnetic recording medium, having improved running

durability, an improved S/N ratio and an improved coefficient of friction comprising:

a non-magnetic support having provided thereon;

a magnetic layer, wherein the magnetic layer is comprised of:

(1) a carbon black having an average primary particle size of smaller than 50 mμ;

(2) a carbon black having an average primary particle size of larger than 150 mμ wherein the weight ratio of (1)/(2) is within the range of 60/40 to 90/10;

(3) a lubricant which is in a liquid state at normal temperature;

ferromagnetic particles; and

a binder.

4,546,039

PROCESS FOR BONDING LIGNOCELLULOSE-CONTAINING RAW MATERIALS WITH A PREPOLYMER BASED ON A URETHANE-MODIFIED DIPHENYLMETHANE DIISOCYANATE MIXTURE

Heinrich Horacek; Otto Wittmann, both of Frankenthal; Matthias Marx, Bad Durkheim, and Johann Mayer, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,199

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216363

Int. Cl.⁴ B32B *5/16, 21/08*

U.S. Cl. 428—357 **6 Claims**

1. In the process for bonding lignocellulose-containing raw materials by the process comprising (1) coating the lignocellulose-containing raw material with a bonding agent and (2) reacting and curing the mixture at elevated temperature and pressure, the improvement comprising employing as bonding agent an isocyanate group-containing prepolymer which has a free isocyanate group content of about 15 to about 33.6 weight percent based on the weight of prepolymer and having a viscosity of 120 to 1000 mPas at 25° C. which prepolymer is prepared by reacting at about 20° C. to about 120° C. about 0.05 to about 0.5 hydroxyl equivalent of

(a) a polyol having 2 to 8 hydroxyl groups and a molecular weight of about 62 to about 2000

per isocyanate equivalent of

(b) a polyisocyanate mixture which contains 0 to about 50 weight percent polyphenyl polymethylene polyisocyanates and about 50 to 100 weight percent of diphenylmethane diisocyanate isomer mixture based on total weight of polyisocyanate mixture, said diphenylmethane diisocyanate isomer mixture containing about 10 to about 75 weight percent 2,4'-isomer and about 25 to about 90 weight percent 4,4'-isomer based on the weight of diisocyanate.

4,546,040

CIGARETTE FILTER AND METHOD OF MANUFACTURE

Lubomír Knotek, Svit; Jozef Peciar, Nitra; Ivan Mitterpach, Poprad; Jozef Hudák, Batizovce; Ján Simo; Ján Badura, both of Poprad; Viliam Beseda, Bratislava; Frantisek Mihály, Bratislava; Alexander Gregor, Bratislava, and Ján Klisky, Bratislava, all of Czechoslovakia, assignors to Vyskummy ustav chemickych claken, Svit, Czechoslovakia

Filed Jun. 11, 1984, Ser. No. 618,998

Claims priority, application Czechoslovakia, Jun. 9, 1983, 4146-83

Int. Cl.⁴ A24C *5/50;* **B32B** *3/00;* **D02G** *3/00*

U.S. Cl. 428—370 **1 Claim**

1. A cigarette filter material comprising a sliver of crimped polypropylene multicomponent fibers, having microfissures on their surfaces and micropores on their cross-sections, wherein the elementary fibers in the sliver have different centers of gravity, are present in a ratio ranging from 1:3 to 3:1 by weight, have from 5 to 7 crimps per centimeter of length, and have a unit fineness of from 5 to 7 dtex.

4,546,041

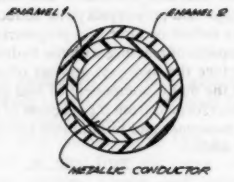
CORONA-RESISTANT WIRE ENAMEL COMPOSITIONS AND CONDUCTORS INSULATED THEREWITH

John J. Keane, Ballston Lake, and Denis R. Pauzé, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 374,844, May 5, 1982, , which is a continuation of Ser. No. 296,071, Aug. 25, 1981, abandoned, which is a continuation of Ser. No. 145,947, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 61,700, Jul. 30, 1979, abandoned. This application Jul. 25, 1983, Ser. No. 517,094

Int. Cl.⁴ B32B *9/00, 15/00, 27/00;* **H01B** *7/00*

U.S. Cl. 428—372 **1 Claim**



1. An electrical conductor coated with a corona-resistant wire enamel comprising a polyetherimide resin and containing from approximately 1% to approximately 35% by weight of alumina particles having a size from approximately 0.005 microns to about 0.050 microns, said alumina particles being dispersed through said resin by high shear mixing.

4,546,042

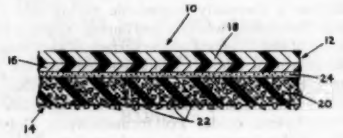
PRODUCT HAVING COMBINED PHOSPHORESCENT-REFLECTIVE APPEARANCE AND METHOD

Joe S. Quon, Sunnyside, N.Y., assignor to Multi-Tex Products Corp., Kearny, N.J.

Continuation-in-part of Ser. No. 538,870, Oct. 4, 1983,. This application Jan. 27, 1984, Ser. No. 574,487

Int. Cl.⁴ D02G *3/00*

U.S. Cl. 428—378 **14 Claims**



1. A decorative composite laminated yarn product comprising one or more filaments formed from a composite laminate, said composite laminate comprising:

A. a phosphorescent film component, said phosphorescent film component comprising a thermoplastic resin base and a layer of a decorative phosphorescent composition applied thereto, said phosphorescent composition comprising a phosphorescent colorant disposed in an organic resin binder in an amount of up to about 50% by weight of said phosphorescent composition; and

B. a retroreflective film component bound to said phosphorescent film component, said retroreflective film component comprising a thermoplastic resin base having a plurality of glass beads bound to one broad surface and a layer of an adhesive coating on the other broad surface thereof;

C. said phosphorescent film component laminated to said ret-

roreflective film component with said phosphorescent composition and said exposed beads disposed on their respective opposed outer surfaces, and said adhesive coating disposed therebetween.

12. A method for preparing a decorative laminated filaments offering a combined phosphorescent and retroreflective decorative appearance, comprising:

A. providing a length of a thermoplastic resinous film having a thickness of up to about 1 mil;

B. coating the thermoplastic resinous film with a phosphorescent coating composition comprising

i. a phosphorescent colorant component, and

ii. a resin binder material,

iii. said colorant component present in an amount by weight of up to 50% of the total weight of said composition,

iv. said resin binder material selected from the group consisting of polyester resins, polyurethane resins, acrylic polymers and copolymers, polyolefins, elastomers, and mixtures thereof;

C. drying the film coated in accordance with Step B above;

D. preparing a second indefinite length of a retroreflective film comprising a thermoplastic resin base having bonded to it a plurality of glass beads on one broad surface and a layer of an adhesive coating disposed on the opposite broad surface thereof;

E. laminating the coating film prepared in Steps A–C above to the retroreflective film with said phosphorescent composition and the surface bearing exposed of said beads disposed to be on the outer surfaces of said composite, and with said adhesive coating disposed between the two, by passing the films in this orientation together through heated pressure rollers; and

F. longitudinally slitting the composite laminate product prepared in Step E to form a plurality said filaments.

4,546,043

HOLLOW IRREGULAR MULTIFILAMENT YARN AND PROCESS AND SPINNERET FOR PRODUCING THE SAME

Masato Yoshimoto, and Shinji Ohwaki, both of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 17, 1985, Ser. No. 692,386

Claims priority, application Japan, Jan. 18, 1984, 59-5699; Feb. 29, 1984, 59-36097

Int. Cl.[4] D02G *3/00*

U.S. Cl. 428—397 **16 Claims**

1. A synthetic polymer hollow irregular multifilament yarn capable of being converted to a bulky yarn, consisting of a plurality of hollow irregular individual filaments, each of which filaments comprises

(A) a hollow filamentary constituent extending along the longitudinal axis of the filament and having at least one hollow extending therealong;

(B) a non-hollow sinuous filamentary constituent sinuously extending in a wave form along the hollow filamentary constituent (A) and having an average thickness smaller than that of the hollow filamentary constituent (A); and

(C) a middle filamentary constituent distortedly extending along the hollow filamentary constituent (A), while connecting therethrough the non-hollow sinuous filamentary constituent (B) to one side of the hollow filamentary constituent (A) to provide a body of hollow irregular filament having a thickness varying along the longitudinal axis of the filament, and having a cross-sectional profile in the form of a waist formed between the hollow filamentary constituent (A) and the non-hollow sinuous filamentary constituent (B).

4,546,044

MAGNETIC RECORDING MEDIUM

Masao Asano, Tokyo; Tetsuro Sunaga, Hachioji; Hideki Murata, Akishima, and Kazumasa Matsumoto, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1983, Ser. No. 485,628

Claims priority, application Japan, Apr. 22, 1982, 57-68189; Apr. 30, 1982, 57-74028; May 14, 1982, 57-82063

Int. Cl.[4] B32B *27/38;* G11B *5/70*

U.S. Cl. 428—413 **7 Claims**

1. A magnetic recording medium having a magnetic layer containing a urethane resin having a tensile strength of less than 175 kg/cm^2 and an elongation at break of 1000% or more, and another urethane resin having a tensile strength of 225 kg/cm^2 or more and an elongation at break of less than 800% wherein the mixing ratio of said urethane to said another urethane is from 80:20 to 20:80 on a weight basis.

4,546,045

METHOD FOR REDUCING TEMPERATURE RISE OF HEAT SENSITIVE SUBSTRATES

Richard C. Elias, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 27, 1984, Ser. No. 686,880

Int. Cl.[4] B05D *7/04;* B32B *27/08*

U.S. Cl. 428—424.6 **12 Claims**

1. A method for reducing the temperature rise associated with sunlight exposure of non-metallic substrates, which comprises coating the non-metallic substrate with a coating composition comprising a film-forming polymer and an effective amount of an infrared reflective pigment, said coating composition having a CIELAB L* value of up to 70 and resulting in the coated substrate reflecting at least 45 percent of impinging infrared energy.

4,546,046

SUBSTRATES WITH FLEXIBLE COATINGS FROM EPSILON-CAPROLACTONE MODIFIED ACRYLICS

Roger A. Etzell, Farmington Hills; Bertram J. Miller, Roseville, and Dennis J. Dziekan, Farmington Hills, all of Mich., assignors to Glasurit America, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 473,868, Mar. 10, 1983, abandoned. This application Apr. 26, 1985, Ser. No. 726,945

Int. Cl.[4] B05D *1/36, 3/02, 7/16;* B32B *15/08*

U.S. Cl. 428—460 **35 Claims**

1. A method of coating a continuous substrate having plastic and metal sections with a flexible coating comprising:

(a) applying to said substrate a coating composition comprising about 40 to 95% by weight of an epsilon-caprolactone modified acrylic polymer and about 5 to 45 % by weight of an aminoplast resin cross-linking agent, said epsilon-caprolactone modified acrylic polymer having a number average molecular weight of about 1,000 to 6,000, hydroxyl contents from about 1 to 7% by weight, and about 0.25 to 6 moles of epsilon-caprolactone per mole of hydroxyl in the polymer; and

(b) curing said coating to said substrate.

24. A coated article comprising:

(a) a continuous substrate having plastic and metal sections; and

(b) a top coat layer applied to said substrate having a thickness of about 1.4 to 2.2 mils and comprising about 40 to 95% by weight of an epsilon-caprolactone modified acrylic polymer and about 5 to 45% by weight of an aminoplast resin cross-linking agent, said epsilon-

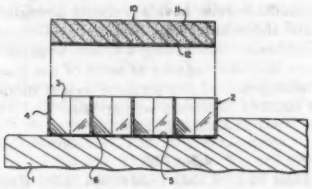
caprolactone modified acrylic polymer having a number average molecular weight of about 1,000 to 6,000, hydroxyl contents from about 1 to 7% by weight, and about 0.25 to 6 moles of epsilon-caprolactone per mole of hydroxyl in the polymer and about 0.5 to 150% by weight of pigments based on the weight of said polymer.

4,546,047

COMPOSITE TAPE PREFORM FOR ABRADABLE SEALS

Edward J. Ryan, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 225,074, Jan. 14, 1981, Pat. No. 4,409,054.
This application May 2, 1983, Ser. No. 490,949
Int. Cl.⁴ B22F *3/00, 7/00*
U.S. Cl. 428—565 **2 Claims**



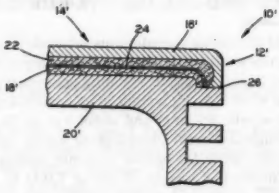
1. A composite abradable preform consisting of a layer of powered material containing a substantial amount of braze alloy, a second layer joined to the first layer comprising a powdered abradable composition consisting by weight of 60–80% nickel, 2–12% chromium, 1–10% cobalt, 4–20% aluminum, 3–15% of an inert material selected from the group consisting of diatomaceous earth, boron nitride, silica glass, mica, vermiculite, asbestos, molybdenum disulfide, graphite, cobalt oxide, cerium oxide, zinc oxide, and mixtures thereof, and up to 3% of a material selected from the group consisting of yttrium, hafnium, lanthanum, and mixtures thereof, both of said layers also containing a binder and a plasticizer and being flexible and compliant.

4,546,048

COMPOSITE THERMAL SHIELD FOR ENGINE COMPONENTS

William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 23, 1984, Ser. No. 592,647
Int. Cl.⁴ B32B *15/14;* B22D *19/00;* F02F *3/02*
U.S. Cl. 428—608 **13 Claims**



1. An engine component comprising a substrate metal and having a composite thermal shield covering a portion of an external surface of said component, said composite shield comprising an external solid metal layer, a first layer of permeable metal bonded to said external solid metal layer, an internal solid metal layer, and a second permeable metal layer, said internal solid metal layer positioned intermediately of and bonded on its opposed sides to said first and second permeable metal layers, wherein the interstices of said second permeable metal layer are substantially filled with said substrate metal, whereby said composite thermal shield is mechanically affixed to the substrate metal of said engine component, and wherein said substrate metal extends into said interstices of only said second permeable metal layer, said internal solid metal layer being disposed for preventing substrate metal from entering said first layer of permeable metal during manufacture of said component.

4,546,049

ORNAMENTAL COMPOSITE OF A METAL ALLOY SURROUNDING A MINERAL POWDER CORE FOR USE IN SPECTACLE FRAMES

Takashi Kuze, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 14, 1983, Ser. No. 561,515
Claims priority, application Japan, Dec. 17, 1982, 57-220215
Int. Cl.⁴ B32B *15/02, 15/14, 15/16*
U.S. Cl. 428—621 **12 Claims**

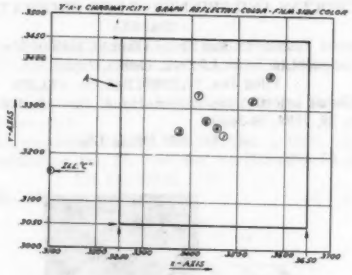
1. An ornamental composite material comprising a covering made of material selected from the group consisting of a nickel-base alloy, a gold-base alloy, a silver-based alloy and a copper-base alloy; and a core consisting of an aggregate of a mineral powder.

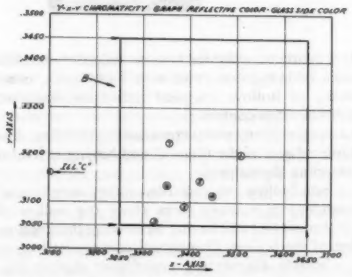
4,546,050

COATED GLASS ARTICLE AS A NEW ARTICLE OF MANUFACTURE

Charles J. Amberger, Northville, and James N. Lingscheit, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 23, 1984, Ser. No. 674,383
Int. Cl.⁴ C25D *11/34*
U.S. Cl. 428—630 **3 Claims**





1. As a new article of manufacture:
a glass sheet having first and second sides, said sides being spaced apart in generally parallel planes;

a multilayer coating film on one of said sides of said glass sheet, said side of said glass sheet having said multilayer coating film thereon designated as said film side of said glass sheet while said other side is designated as said glass side of said glass sheet;

said multilayer coating film being a film selected from the group of films consisting of a copper, stainless steel, titanium dioxide multilayer film; a copper, titanium, titanium dioxide multilayer film; and a copper, titanium, titanium nitride multilayer film;

said multilayer coating film also being characterized when applied to 6 mm clear glass as having (1) a film side Y-x-y chromaticity value of reflective color falling within area A of the graph of FIG. 1; (2) a glass side Y-x-y chromaticity value of reflective color falling within area B of the graph of FIG. 2; (3) a visible transmittance of 5–40% for an Illuminant "C" light source; and (4) a capital Y reflectance value from 5–55 for film side reflectance and 10–45 for glass side reflectance.

4,546,051

ALUMINUM COATED STEEL SHEET AND PROCESS FOR PRODUCING THE SAME

Yukio Uchida, Sakai; Kazuhiro Takagi, Amagasaki; Kiichiro Katayama, Funabashi, and Hisao Kawase, Kure, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 396,359, Jul. 8, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,804

Int. Cl.⁴ C23C *1/08*

U.S. Cl. 428—653 **5 Claims**

1. An aluminum hot dip coated steel sheet consisting essentially of

(1) a steel substrate containing 0.002 to 0.02% by weight of solute N and not more than $\sqrt{5/3N-1/300}$% by weight of total C, wherein N represents the percentage of the solute N, and having a recrystallized structure;

(2) an aluminum coating layer on at least one surface of said steel substrate comprising essentially Al and 1 to 15% by weight of spheroidal Si and having a recrystallized structure, and:

(3) a discontinuous intermediate layer at the interface between said steel substrate and aluminum coating layer and comprising essentially Al—Fe—Si intermetallic compounds.

4,546,052

HIGH-TEMPERATURE PROTECTIVE LAYER

Andrew R. Nicoll, Oftersheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Jul. 17, 1984, Ser. No. 631,578

Claims priority, application European Pat. Off., Jul. 22, 1983, 83107217.8

Int. Cl.⁴ C25D *11/02*

U.S. Cl. 428—679 **2 Claims**

1. A high temperature protective layer having an alumina containing top layer comprising an oxide dispersion-hardened alloy having a base material of 25–27% by weight of chromium, 4 to 7% by weight of aluminum relative to the total weight of the alloy and the remaining component of the base material is nickel and the alloy contains as additives 1 to 3% by weight silicon and 1 to 2% by weight of zirconium relative to the total weight of the alloy.

4,546,053

SEALED LEAD-ACID STORAGE CELLS

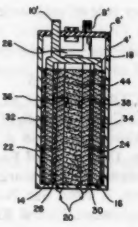
Erik G. Sundberg, 447 Union St., Newtown Crossing, Pa. 18940

Filed Jan. 17, 1985, Ser. No. 692,669

Claims priority, application Sweden, May 7, 1984, 8402437

Int. Cl.⁴ H01M *10/12, 4/14*

U.S. Cl. 429—57 **18 Claims**



1. A sealed lead-acid storage cell, comprising a container impervious to both gas and electrolyte, at least one positive electrode assembly, a plurality of porous negative electrodes arranged in alternating relationship with the positive electrode assemblies, porous absorbant separators located between adjacent surfaces of the negative electrodes and the positive electrode assemblies, and an electrolyte;

characterized in that each positive electrode assembly comprises a first porous positive electrode member and a second porous positive electrode member lying in spaced apart relationship and electrically connected in parallel with one another, each first and second positive electrode member defining a space lying therebetween which comprises an electrolyte reservoir; foraminous material bodies being contained in the said electrolyte reservoirs; the electrolyte being absorbed within the pores of the negative electrodes, the positive electrodes, the separators and the foraminous material bodies; the combined volumes of the pores of the positive electrode members, the negative electrodes, the separators and the foraminous material bodies being greater than the volume of the said electrolyte.

4,546,054

SUPPORT ASSEMBLY FOR CELLS OF A SECONDARY BATTERY

Dennis D. Carr, Jasper, and Riley C. Walton, Joplin, both of Mo., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Feb. 22, 1985, Ser. No. 704,182

Int. Cl.⁴ H01M *2/10*

U.S. Cl. 429—101 **11 Claims**

1. A battery comprising:

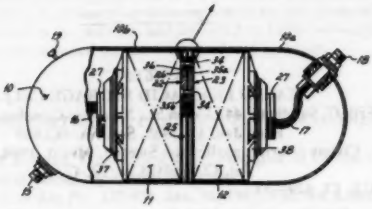
a pressure vessel having two half sections,

a weld ring having two opposite sides, said half sections being fixed to respective sides of said weld ring,

first and second cell stacks, each stack including anodes, cathodes, separators and electrolyte,

means for conducting current from said cell stacks to do work, and

means for mounting said first cell stack to one side of said weld ring within one half section and said second cell stack to the other side of said weld ring in the other half section.



4,546,055
ELECTROCHEMICAL CELL

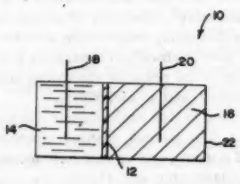
Johan Coetzer; Roy C. Galloway, both of Pretoria, South Africa; Roger J. Bones, Abingdon; David A. Teagle, Swindon, and Patrick T. Moseley, Didcot, all of England, assignors to Lilliwyte Societe Anonyme, Luxembourg, Luxembourg

Filed Dec. 2, 1982, Ser. No. 446,432

Claims priority, application United Kingdom, Dec. 10, 1981, 8137343

Int. Cl.⁴ H01M *10/39*

U.S. Cl. 429—103 **30 Claims**



1. An electrochemical cell which comprises a sodium anode which is molten at the operating temperature of the cell, a sodium aluminum chloride molten salt electrolyte which is also molten at the operating temperature of the cell, a cathode which is impregnated by the electrolyte and comprises, as the electrochemically active cathode substance of the cell, a transition metal chloride selected from the group consisting in $FeCl_2$, $NiCl_2$2, $CoCl_2$ and $CrCl_2$ dispersed in a matrix which is permeable by the electrolyte in liquid form and is electronically conductive, and, between the anode and the electrolyte and isolating the anode from the electrolyte, a solid conductor of sodium ions or a micromolecular sieve which contains sodium sorbed therein, the proportions of sodium ions and aluminum ions in the electrolyte being selected so that the active cathode substance is substantially insoluble in the molten electrolyte.

4,546,056
HIGH-TEMPERATURE STORAGE BATTERY

Jens C. Jessen, Eppelheim, and Dieter Hasenauer, Weinheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

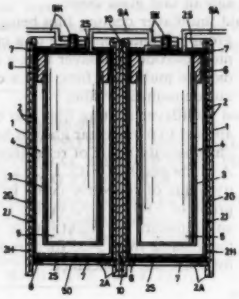
Filed Nov. 9, 1984, Ser. No. 670,376

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340425

Int. Cl.⁴ H01M *6/42*

U.S. Cl. 429—149 **17 Claims**

1. High-temperature storage battery containing a plurality of storage cells based on alkali metal and chalcogen, with each storage cell bounded by a metallic housing, and at least four of the cells combined and connected to each other to form a module, the combination therewith of (a) the housing of each cell comprising two concentrically arranged housing elements which are separated from each other by electrical insulation, and (b) the cells in the module are arranged with each cell having at least two adjacent cells with the outer housings of the cells connected to each other.



4,546,057
POSITIVE ACTIVE MATERIAL FOR ELECTROCHEMICAL CELLS AND ELECTROCHEMICAL CELLS USING SAID MATERIAL

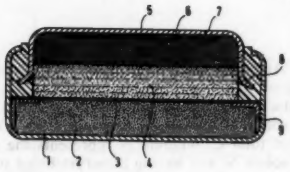
Michel Broussely, Liguge, and André Lecerf, Pace, both of France, assignors to Saft, S.A., Romainville, France

Filed Jul. 30, 1984, Ser. No. 635,824

Claims priority, application France, Aug. 3, 1983, 83 12809

Int. Cl.⁴ H01M *6/14*

U.S. Cl. 429—218 **7 Claims**



1. An electrochemical cell having a positive active material constituted by an anhydrous borate having the formula $Bi_4B_2O_9$, and having a negative electrode in the form of an alkali metal or an alkali metal alloy.

4,546,058
NICKEL ELECTRODE FOR ALKALINE BATTERIES

Allen Charkey, Brookfield, Conn., and Stanley Januszkiewicz, South Hadley, Mass., assignors to Energy Research Corporation, Danbury, Conn.

Filed Dec. 12, 1984, Ser. No. 680,975

Int. Cl.⁴ H01M *4/32*

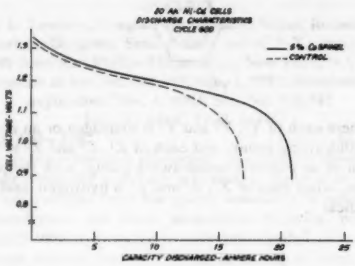
U.S. Cl. 429—223 **7 Claims**

1. A nickel electrode comprising:

an electrically conductive support;

a layer on said support, said layer comprising a mixture of a nickel active material and a conductive graphite diluent containing a spinel, type oxide, said spinel type oxide

having the general formula $M_2Co_2O_4$, where M_2 is Co, Ni, Mn, Fe, Cu, Zn or Cd, or combinations thereof, said spinel



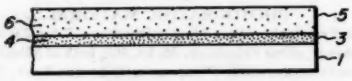
type oxide having a weight which is in the range of 1–30 percent of the weight of said diluent.

4,546,059

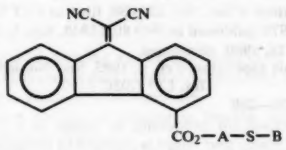
LAYERED PHOTORESPONSIVE IMAGING MEMBERS WITH SULFUR INCORPORATED DICYANOMETHYLENEFLUORENE CARBOXYLATE COMPOSITIONS

Beng S. Ong, and Dasarao K. Murti, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1984, Ser. No. 669,499
Int. Cl.⁴ G03G *5/06, 5/14*
U.S. Cl. 430—59 **21 Claims**



1. An improved layered photoresponsive imaging member comprised of a supporting substrate, a photogenerating layer, and in contact with the photogenerating layer, an electron transporting layer comprised of compounds of the following formula



wherein A is a spacer linkage selected from the group consisting of alkylene groups, aromatic groups, substituted alkylene groups, and substituted aromatic groups; S is sulfur, and B is selected from the group consisting of alkyl groups, aryl groups, substituted alkyl groups, and substituted aryl groups.

20. An improved imaging member in accordance with claim 1 wherein the electron transporting layer has incorporated therein a stabilizing amount of an aryl amine.

4,546,060

TWO-COMPONENT, DRY ELECTROGRAPHIC DEVELOPER COMPOSITIONS CONTAINING HARD MAGNETIC CARRIER PARTICLES AND METHOD FOR USING THE SAME

Edward T. Miskinis, and Thomas A. Jadwin, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,807
Int. Cl.⁴ G03G *9/14*
U.S. Cl. 430—108 **43 Claims**

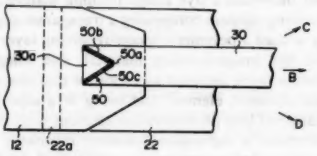
1. An electrographic, two-component dry developer composition comprising charged toner particles and oppositely charged carrier particles which (a) comprise a hard magnetic material exhibiting a coercivity of at least 300 gauss when magnetically saturated and (b) exhibit an induced magnetic moment of at least 20 EMU/gm of carrier when in an applied field of 1000 gauss.

4,546,061

FILM UNIT FOR INSTANT CAMERA

Minoru Ono; Teruyoshi Makino, and Hisashi Kikuchi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1984, Ser. No. 666,105
Claims priority, application Japan, Nov. 1, 1983, 58-169659[U]
Int. Cl.⁴ G03C *5/54, 1/96;* **G03D** *9/02*
U.S. Cl. 430—207 **1 Claim**



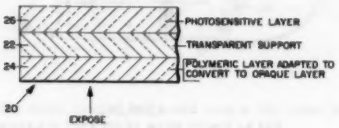
1. A film unit for an instant camera comprising a photosensitive sheet having a photosensitive surface adapted to be exposed to light to form an image of an object, a leader sheet connected to one end of the photosensitive sheet, a carrier sheet which is connected to one end of an image receiving sheet having thereon an image receiving surface to which the image of the object on the photosensitive surface is transferred, and is superposed on the leader sheet and bonded thereto, and a drawer member having a first end bonded to the leader sheet near the bonding portion between the leader sheet and the carrier sheet and a second end adapted to be projected outside the camera when the film unit is loaded therein, the leader sheet having a leading end which is adapted to be projected outside the camera body passing through a pressure device in the camera by pulling said second end of the drawer member, the photosensitive sheet and the image receiving sheet being arranged to be pressed against each other by the pressure device when they are passed through the pressure device by pulling the leading end of the leader sheet with a developing solution bag containing therein developing solution being broken to release the developing solution between the photosensitive sheet and the image receiving sheet wherein the improvement comprises that said first end of the drawer member is bonded to the leader sheet by way of adhesive applied in V-shape, the apex of the V-shape being directed in the pulling direction of the drawer member and being centered in the direction of width of the leader sheet, the shear strength of the V-shaped portion being stronger than the tensile force exerted on the first end of the drawer member when it is pulled to project the leading end of the leader sheet outside the camera body, and the peel strength of the V-shaped bonding portion being adjusted to be weaker than the tensile force exerted thereon in the direction of peeling the first end of the drawer member off the leader sheet.

4,546,062

POLYMERIC PH-SENSITIVE OPTICAL FILTER AGENTS AND ARTICLES INCLUDING SAME

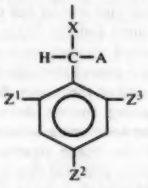
Irena Y. Bronstein-Bonte, Newton, and Edward P. Lindholm, Brookline, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 30, 1984, Ser. No. 635,734
Int. Cl.[4] G03C *5/54, 1/40, 1/84*
U.S. Cl. 430—215 **35 Claims**

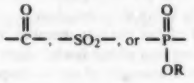


14. A photographic film unit for forming a diffusion transfer image which comprises in combination:

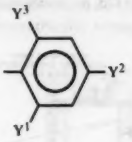
a photosensitive element comprising an opaque support carrying at least one photosensitive silver halide emulsion layer, each said silver halide emulsion layer having associated therewith a dye image-forming material; an image-receiving element comprising a transparent support carrying at least a polymeric image-receiving layer dyeable by said dye image-forming material, said image-receiving element being adapted to exposure therethrough of said photosensitive element and being in a superposed fixed relation to said photosensitive element with said supports outermost; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being positioned so as to release said processing composition for distribution between said dyeable polymeric layer and said photosensitive element adjacent thereto upon application of pressure to said container after photoexposure of said photosensitive element; and disposed in said film unit in said processing composition and/or in a layer intermediate said photosensitive element and said image-receiving element, a polymeric optical filter agent having a light-absorbing capability at a pH above the pKa of the optical filter agent effective to absorb at least a portion of actinic radiation within a predetermined range, said polymeric optical filter agent comprising a polymeric backbone having pendant therefrom a plurality of moieties of the formula



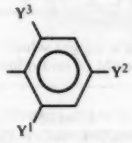
wherein X is



and R is alkyl, aryl, alkaryl or aralkyl; A is hydrogen, alkyl or the radical



where each of Y^1, Y^2 and Y^3 is hydrogen or an electron-withdrawing group; and each of Z^1, Z^2 and Z^3 is hydrogen or an electron-withdrawing group; with the proviso that, when each of Z^1, Z^2 and Z^3 is hydrogen, said A is a radical



wherein at least one of said Y^1, Y^2 and Y^3 groups comprises an electron-withdrawing group.

4,546,063

PHOTOGRAPHIC MATERIAL

Igor N. Ermolenko, ulitsa Akademicheskaya, 7, kv. 23; Vasily D. Koshevar, ulitsa Shirokaya, 36, kv. 404, both of Minsk; Viktor S. Nedzvetsky, ulitsa Planernaya, 1, korpus 2, kv. 55, Moscow; Galina N. Savastenko, ulitsa Vostochnaya, 17, kv. 114, Minsk; Valentina M. Siderko, prospekt Pushkina, 47, kv. 142, Minsk; Fedor N. Kaputsky, ulitsa Chervyakova, 4, kv. 63, Minsk; Valentina V. Komar, ulitsa Akademicheskaya, 17, kv. 3, Minsk, and Juzefa I. Nadievskaya, ulitsa Shirokaya, 36, kv. 813, Minsk, all of U.S.S.R.

Division of Ser. No. 499,419, Jun. 2, 1983, abandoned, which is a continuation of Ser. No. 227,058, filed as PCT SU 79/00006, Feb. 22, 1979, published as WO 80/01848, Sep. 4, 1980, § 102(e) date Oct. 16, 1980, abandoned.
This application Feb. 4, 1985, Ser. No. 698,733
Int. Cl.[4] G03C *1/90*
U.S. Cl. 430—269 **12 Claims**

1. A method for producing an image on a photographic material wherein said image is exposed to ultraviolet radiation which comprises the steps of:

(a) exposing said image on a photographic material consisting essentially of at least one member selected from the group consisting of acid ethers of cellulose, acid esters of cellulose, salts of acid ethers of cellulose, salts of acid esters of cellulose, polymers of acid ethers of cellulose with acrylic monomers, polymers of acid esters of cellulose with acrylic monomers, salts of polymers of acid ethers of cellulose with acrylic monomers and salts of polymers of acid esters of cellulose with acrylic monomers, said members being substantially water-insoluble and having the ability of forming metastable electron-excess centers of latent image under the action of ultraviolet radiation,

(b) treating said exposed photographic material with an aqueous solution containing reducible metal ions, and

(c) treating said exposed photographic material with a solvent for selectively reducing said metal ions at exposed portions of said photographic material to develop said image.

4,546,064

POSITIVE-WORKING PHOTORESIST COMPOSITION AND METHOD FOR FORMING A LIGHT-ABSORBING MATRIX

Robert L. Lambert, Seneca Falls; Judy A. Nagel, Romulus, and Robert L. Bergamo, Seneca Falls, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 364,949, Apr. 2, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 548,747

Int. Cl.[4] G03C *5/00, 1/495*

U.S. Cl. 430—270 12 Claims

1. A positive-working photoresist composition developable by water consisting essentially a mixture in water of an organic ferric salt selected from the group consisting of ammonium trioxalatoferrate and ferric ammonium tricitrate, polyvinyl acetate 85–99% hydrolyzed to polyvinyl alcohol, an inorganic ferric salt selected from the group consisting of ferric nitrate and ferric sulfate and a diol selected from the group consisting of 1,4-butanediol, 1,5-pentanediol and 1,4-pentanediol.

4,546,065

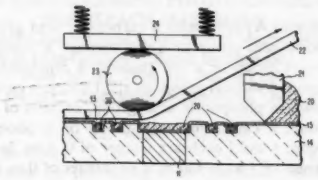
PROCESS FOR FORMING A PATTERN OF METALLURGY ON THE TOP OF A CERAMIC SUBSTRATE

Albert Amendola, Hopewell Jct.; Arnold F. Schmeckenbecher, Poughkeepsie, and Joseph T. Sobon, New Paltz, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 8, 1983, Ser. No. 521,464

Int. Cl.[4] G03F *1/00, 7/00;* B23P *19/00*

U.S. Cl. 430—313 11 Claims



1. A process for forming a pattern of conductive lines on the top of a multi-layer ceramic substrate comprising the steps of:

providing a green ceramic substrate;

embossing a pattern of grooves in the top surface of the green ceramic substrate;

sintering the green ceramic substrate to thereby form a multi-layer ceramic substrate;

depositing a conductive material in at least a portion of said embossed pattern of grooves, wherein said depositing comprises the steps of:

glazing the top of said multi-layer ceramic substrate with a glazing material;

wiping a colored substance in at least a portion of said embossed pattern of grooves;

taking a photograph of the top of said multi-layer ceramic substrate;

generating a mask from said photograph; and

photolithographically depositing a conductive material on the top of said multi-layer ceramic substrate in accordance with the pattern of said mask and in said pattern of grooves using a photoresist formed by developing a deposited photoresist forming layer exposed through the mask, wherein subsequent to taking the photograph but prior to photolithographically depositing the conductive material the colored substance is removed form the embossed pattern of grooves.

4,546,066

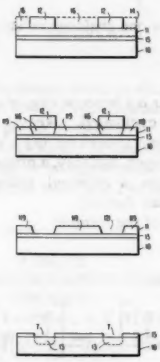
METHOD FOR FORMING NARROW IMAGES ON SEMICONDUCTOR SUBSTRATES

Cheryl B. Field, Granite Springs, and Russell C. Lange, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1983, Ser. No. 536,100

Int. Cl.[4] G03C *5/00;* G03F *7/26*

U.S. Cl. 430—314 6 Claims



1. A method of forming recessed oxide isolation regions on a surface of a semiconductor substrate comprising the steps of:

(1) forming an insulating layer on the surface of said semiconductor substrate;

(2) coating said insulating layer with a layer of positive-working photoresist which can be modified to provide a negative image;

(3) imagewise exposing said photoresist through a mask having opaque regions at locations corresponding to said recessed oxide isolation locations on said substrate and having transparent regions corresponding to locations not corresponding to said recessed oxide isolation locations on said substrate under exposure conditions so as to 50 to 100% overexpose the portions of said photoresist coextensive with said transparent regions and the pheripery of the areas of the photoresist corresponding to the opaque regions of said mask;

(4) treating the exposed areas of said photoresist to render them insoluble in a developer, thereafter blanket exposing the photoresist layer and then removing, by developing, the areas of the photoresist which were not imagewise exposed during the exposure of step (3);

(5) etching the regions of said insulating layer corresponding to the removed portions of said mask to thereby uncover the corresponding portions of the semiconductor substrate; and

(6) oxidizing the uncovered portions of said semiconductor substrate to provide said recessed oxide isolation regions.

4,546,067

IMAGE PRODUCTION UTILIZING MULTIFUNCTIONAL LIGHT SENSITIVE COMPOUNDS

Edward Irving, Burwell, and Terence J. Smith, Royston, both of England, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,211

Claims priority, application United Kingdom, Jan. 26, 1983, 8302160; Sep. 1, 1983, 8323448

Int. Cl.[4] G03C *5/16*

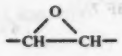
U.S. Cl. 430—325 19 Claims

1. A process for the production of an image which comprises

(i) heating a layer, supported on a carrier, of a liquid composition containing

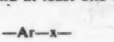
(A) a heat-activated latent polymerizing agent for 1,2-epoxides with

(B) a light-sensitive compound having in the same molecule at least one 1,2-epoxide group of formula



I

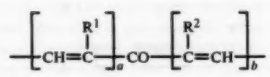
and at least one chalcone or cinnamate group of formula



II

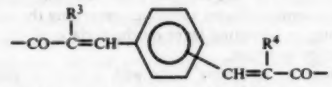
wherein Ar is a benzene ring or a benzene ring substituted by alkyl, cycloalkyl, alkenyl, alkoxy, alkoxycarbonyl, each of these groups having a maximum of nine carbon atoms, halogen, hydroxy, a primary, secondary or tertiary amino, nitro, a carboxyl, sulfonic or phosphonic acid group or salt thereof;

X is a chain of the formula



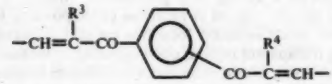
III

or



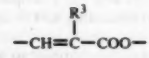
IV

or



V

or



VI

R^1 and R^2 individually denote a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or conjointly denote a polymethylene chain of 2 to 4 methylene groups,

R^3 and R^4 each denote a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, or a phenyl group, and

a and b each denote zero, 1, or 2 with the proviso that they do not both denote zero,

or with a mixture of

(C) a compound containing at least one 1,2-epoxide group of formula I, together with

(D) a compound containing at least one chalcone or cinnamate group of formula II,

or with a mixture of a light sensitive compound (B) with a compound (C) and/or (D) as herein defined,

such that the layer solidifies by thermal polymerization and becomes essentially non-tacky but remains photocrosslinkable, and subsequently,

(ii) exposing the solidified layer to actinic radiation in a predetermined pattern such that exposed parts of the layer are crosslinked and

(iii) removing those parts of the layer which have not become substantially crosslinked by treatment with a solvent therefor.

4,546,068

METHOD FOR PROCESSING OF LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Satoru Kuse, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 29, 1984, Ser. No. 614,971

Claims priority, application Japan, Jun. 9, 1983, 58-103839; Jul. 30, 1983, 58-140272; Mar. 30, 1984, 59-64378

Int. Cl.[4] G03C 7/30

U.S. Cl. 430—375 **15 Claims**

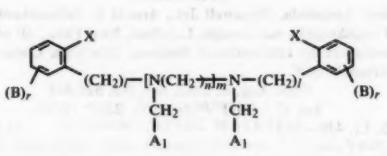
1. A method for processing of a light-sensitive silver halide color photographic material characterized by carrying out, after image exposure of said material, development processing of said material in a developing solution containing the following components (A), (B) and (C) or (D), or both (C) and (D):

(A) an aromatic amine color developing agent compound;

(B) a manganese salt and/or a cerium salt contained in the amount of 0.1 to 20 mg per liter of the developing solution;

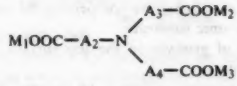
(C) a diphosphonic acid sequestering agent and a magnesium salt and/or a lithium salt; and

(D) at least one of a sequestering agent selected from the group consisting of the compounds represented by the formulas (I), (II), (III), (IV) and (V):

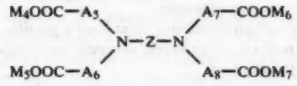


(I)

wherein A_1 represents a carboxylic acid group, a phosphoric acid group or a salt thereof; X represents a hydroxyl group or a salt thereof; B represents a halogen atom, a hydroxyl group, an alkyl group, a carboxylic acid group, a phosphoric acid group, or salts of a hydroxyl group, a carboxylic acid group or a phosphoric acid group; r and l each are integer of 0, 1 or 2; and n is an integer of 1 to 4; and m is an integer of 0 to 3,

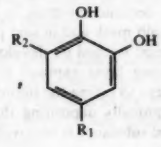


(II)



(III)

wherein A_2, A_3, A_4, A_5, A_6, A_7 and A_8 each represent an alkylene group; Z represents a divalent organic group; and M_1 to M_7 each represent a hydrogen atom or an alkaline metal atom,



(IV)

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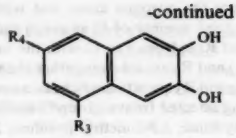


(V)

wherein R_1, R_2, R_3 and R_4 each represent a hydrogen atom, a halogen atom, a sulfonic acid group, an alkyl group having 1 to 7 carbon atoms, —OR_5, —$COOR_6$,

or a phenyl group; and R_5, R_6, R_7 and R_8 each represent a hydrogen atom or an alkyl group having 1 to 18 carbon atoms; provided that when R_2 represents —OH or a hydrogen atom, R_1 represents a halogen atom, a sulfonic acid group, an alkyl group having 1 to 7 carbon atoms, —OR_5, —$COOR_6$,

or a phenyl group.

4,546,069

METHOD FOR PROCESSING PHOTOGRAPHIC SILVER DYE BLEACH MATERIALS

Arnost Libicky, and Meinrad Schär, both of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jul. 18, 1984, Ser. No. 632,087

Claims priority, application Switzerland, Jul. 20, 1983, 3990/83

Int. Cl.⁴ G03C *7/00, 5/44*

U.S. Cl. 430—390 **22 Claims**

1. A method for processing silver dye bleach materials by the process steps of silver development, dye and silver bleaching, and fixing, which comprises using, for the combined dye and silver bleach, a preparation which contains (a) a strong acid in an amount sufficient to maintain the pH value of the preparation below 2, (b) 2 to 50 g/l of a water-soluble iodide, (c) 1 to 30 g/l of a water-soluble organic nitro compound, (d) 0.5 to 10 g/l of an anti-oxidising agent, (e) 0.2 to 5 g/l of a bleach catalyst, (f) 0.1 to 10 g/l of an organic developing agent and/or a benzotriazole derivative.

4,546,070

METHOD FOR PROCESSING COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shinzo Kishimoto; Shigeru Ohno, and Akira Abe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

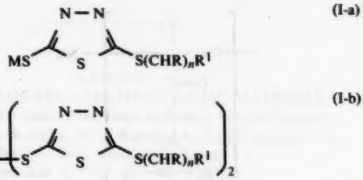
Filed Dec. 10, 1984, Ser. No. 680,115

Claims priority, application Japan, Dec. 12, 1983, 58-233844

Int. Cl.⁴ G03C *7/00*

U.S. Cl. 430—393 **21 Claims**

1. A method for processing a color photographic light-sensitive material comprising subjecting an exposed silver halide color photographic light-sensitive material to color development processing then to bleach processing and fixing processing separately, wherein a bath of the bleach processing contains (a) at least one bleach accelerating agent selected from a compound having a mercapto group or a disulfide bond, a thiazolidine derivative and an isothiourea derivative and (b) at least one compound represented by the following general formula (I-a) or (I-b):



(I-a)

(I-b)

wherein M represents a hydrogen atom, an alkali metal atom or an ammonium ion; R represents a hydrogen atom, a substituted or unsubstituted alkyl group, —SO_3M^1 or —$COOM^1$; R^1 represents —SO_3M^1 or —$COOM^1$; M^1 represents a hydrogen atom, an alkali metal atom or an ammonium ion; and n represents an integer of 1 to 6 and when n is 2 or more, R's may be the same or different.

4,546,071

SILVERLESS PHOTOGRAPHIC MEDIUM AND PROCESS

David Fox, 96 Bud La., Levittown, N.Y. 11756

Filed Jun. 30, 1983, Ser. No. 509,319

Int. Cl.⁴ G03C *5/24*

U.S. Cl. 430—428 **7 Claims**

1. The photographic process comprising exposing a layer including a starch impoverished matrix having chloroplasts distributed therein and in the presence of carbon dioxide and water to a light image of different intensities to produce starch in said layer in amounts varying with the quantities of incident light on respective areas of said layer whereby to produce a latent starch image and thereafter treating said starch with an iodine solution to darken said starch and develop said latent image to a visible image.

4,546,072

TONERS TREATED WITH POLYMERIC QUATERNARY AMMONIUM SALTS AND SLIP AGENT

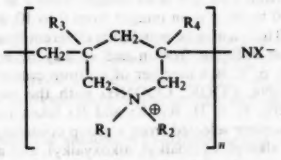
Howard Matrick, Highlands, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1984, Ser. No. 595,361

Int. Cl.⁴ G03C *5/04*

U.S. Cl. 430—449 **10 Claims**

1. A dry nonelectroscopic toner comprising pigmented organic resin particles having a size distribution within the range of 0.2 to 30 micrometers, the improvement whereby the pigmented particles are surface coated with at least 0.1% by weight of liquid slip agent selected from the class consisting of silicone oil having a weight average molecular weight of about 230 to 50,000 and a fluorocarbon compound having a weight average molecular weight of 500 to 500,000, in combination with at least 0.5% by weight of a water soluble, polymeric quaternary ammonium compound selected from the class consisting of

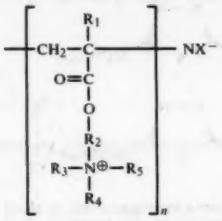


(a)

wherein R_1 and R_2 are independently selected from alkyl groups of 1 to 4 carbon atoms, R_3 and R_4 are independently

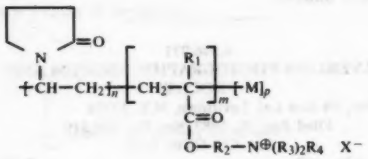
selected from H or CH_3, n is a number from 100 to 50,000, and X is a water-solubilizing anion;

(b)



where R_1 is H or CH_3; R_2 is C_xH_{2x} where x=2–18; R_3 and R_4 are C_xH_{2x+1} where x=1–4; R_5 is the same as R_3 or ϕ-CH_2; X is a water-solubilizing anion; and n is 50 to 20,000;

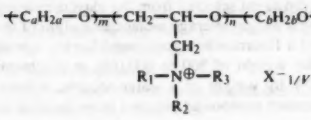
(c)



where n is 40 to 90 mole percent, m is 5 to 40 mole percent, p is 0 to 50 mole percent, and n+m+p=100; R_1 is H or CH_3; R_2 is C_xH_{2x} where x=1 to 18; R_3 is CH_3 or CH_2CH_3; R_4 is CH_3, CH_2CH_3 or ϕ-CH_2; X is a water-solubilizing anion and M is a vinyl monomer unit resulting from the heteropolymerization employing an optional monovinyl nonhydroxy-containing monomer different from and copolymerizable with the m or n units and a weight average molecular weight of 10,000 to 1,000,000.

(d)

where R_{cell} is a residue of an anhydroglucose unit from cellulose ($C_6H_{10}O_5$), methyl cellulose, ethyl cellulose, hydroxyethylcellulose, or hydroxypropyl methyl cellulose; y is the degree of polymerization of 50–20,000 or more; and R may be the same or different and is:



where a is an integer from 2 to 3; b is an integer from 2 to 3; c is an integer from 1 to 3; n is an integer from 1 to 3; m is an integer from 0 to 10; p is an integer from 0 to 10; and q is an integer from 0 to 1; a may be equal to or different from b; c may be equal to or different from n and m may be equal to or different from p; R' is a member of a group consisting of H, COOH, COONa, COOK, $COONH_4$ with the proviso that when q is zero, R' is H; R_1, R_2 and R_3 taken individually represent a member selected from a group consisting of alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxyalkyl, and alkoxyaryl radicals where each of R_1, R_2 and R_3 can contain up to 10 carbon atoms with the proviso that when said member is an alkoxyalkyl radical there are at least two carbon atoms separating the oxygen atom from the nitrogen atom, and with the further proviso that the total number of C atoms in radicals represented by R_1, R_2 and R_3 is from 3 to 12 with the further proviso that when R_1, R_2 and R_3 are taken together the nitrogen atom to which R_1, R_2 and R_3 are attached can be a component of a heterocyclic ring selected from a group consisting of pyridine, alpha-methyl pyridine, 2,5-dimethyl pyridine; 2,4,6-trimethyl pyridine, N-methylpiperidine, N-ethylpiperidine, N-methyl morpholine and N-ethyl morpholine; X is a water-solubilizing anion, and V is an integer equal to the valence of X; the average value of n per anhydroglucose unit of said cellulose ether is from about 0.01 to about 1, and the average value of m+p+q per anhydroglucose unit of said cellulose ether is from about 0.01 to about 4; and

(e) copolymer of hydroxyethyl cellulose and diallyldimethyl ammonium chloride.

4,546,073

PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A PRECURSOR OF A PHOTOGRAPHICALLY-ACTIVE COMPOUND

Peter Bergthaller, Cologne; Heinrich Odenwälder, and Reinhard Matejec, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

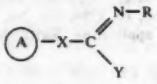
Filed May 16, 1984, Ser. No. 610,786

Claims priority, application Fed. Rep. of Germany, May 28, 1983, 3319428

Int. Cl.[4] G03C *7/26*

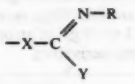
U.S. Cl. 430—543 **4 Claims**

1. Photographic recording material having at least one silver halide emulsion layer, characterised by containing a compound corresponding to the following general formula I:



wherein

A represents the residue of a compound which is capable of oxidative coupling with a silver halide developer compound under the conditions of photographic development and having the group



bonded to its coupling position;

X represents —O—, —S— or —NR^1—;

Y represents a releasable group attached to C through a heteroatom which forms part of the releasable group and capable of being released together with said heteroatom from C as a function of photographic development, taking with it the bonding electron pair between C and Y, when X is released from A, taking with it the bonding electron pair between A and X; said releasable group being the residue of a photographically active compound or the residue of an alkali-labile precursor of a photographically active compound

R represents alkyl, aralkyl, aryl, acyl, a heterocyclic group, or a group —NH—acyl, —OR^2 or —P(O) $(OR^2)_2$;

R^1 represents H, alkyl, aryl, alkylsulphonyl or arylsulphonyl; and

R^2 represents alkyl, aryl or a heterocyclic group.

4,546,074

SILVER HALIDE COLOR LIGHT-SENSITIVE MATERIALS

Sadao Kamei; Yuichi Ohashi; Toshinao Ukai; Kiyohiko Yamamuro, and Haruo Takei, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1983, Ser. No. 539,240

Claims priority, application Japan, Oct. 5, 1982, 57-175198

Int. Cl.[4] G03C *1/02*

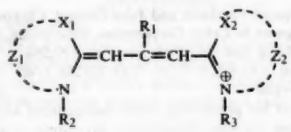
U.S. Cl. 430—573 14 Claims

1. A process for producing a silver halide color photographic light-sensitive material comprising:

providing a silver halide emulsion layer,

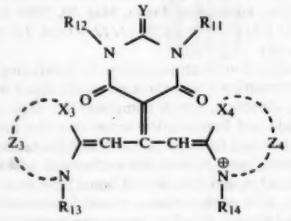
adding iodide ion to a surface low iodine content type silver iodobromide emulsion to adsorb the iodide ion on the surface of the silver iodobromide grains in an amount from 10^{-7} to 10^{-3} mol of the iodide ion per mol of the silver iodobromide; and

adding at least one compound represented by the general formula (I) and at least one compound represented by the general formula (II) to the silver iodobromide emulsion:



(I)

wherein X_1 and X_2 are each a sulfur atom or a selenium atom, Z_1 and Z_2 are each atoms necessary for forming, a benzothiazole, a benzoselenazole, a naphthothiazole or a naphthoselenazole, together with the nitrogen atom and X_1 or X_2, R_1 is a hydrogen atom, an alkyl group containing 6 or less carbon atoms, an aralkyl group containing 12 or less carbon atoms, or a phenyl group, and R_2 and R_3 are each an alkyl group containing 10 or less carbon atoms, or an alkyl group containing 10 or less carbon atoms which is substituted by a sulfo group, a hydroxyl group, a carboxyl group, a carbamoyl group, an alkoxy group, a phenyl group, a sulfophenyl group, a carboxyphenyl group, or a halogen atom, and at least one of R_2 and R_3 contains a sulfo group or a carboxyl group, and at least one compound represented by the general formula (II):



(II)

wherein Y is an oxygen atom or a sulfur atom, X_3 and X_4 are each a sulfur atom or a selenium atom, Z_3 and Z_4 are each atoms necessary for forming a benzothiazole, a benzoselenazole, a naphthothiazole or a naphthoselenazole, together with the nitrogen atom and X_3 or X_4, R_{11} and R_{12} are each an alkyl group containing 6 or less carbon atoms, or an alkyl group containing 6 or less carbon atoms which is substituted by an alkoxyl group containing from 1 to 4 carbon atoms, a chlorine atom, a fluorine atom, or a phenyl group, and R_{13} and R_{14} are each an alkyl group containing 10 or less carbon atoms, or an alkyl group containing 6 or less carbon atoms which is substituted by a sulfo group, a hydroxyl group, a carboxyl group, a carbamoyl group, an alkoxy group, a phenyl group, a sulfophenyl group, a carboxyphenyl group, or a halogen atom.

4,546,075

HEAT-DEVELOPABLE PHOTOGRAPHIC MATERIAL

Hiroshi Kitaguchi; Isamu Itoh; Itsuo Fujiwara; Yasushi Nozawa, and Tadayoshi Kokubo, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

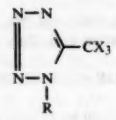
Filed Sep. 9, 1983, Ser. No. 530,822

Claims priority, application Japan, Sep. 9, 1982, 57-157197; Sep. 27, 1982, 57-168184

Int. Cl.[4] G03C *1/34*

U.S. Cl. 430—617 31 Claims

1. A heat-developable photographic material comprising (a) an organic silver salt, (b) a photocatalyst, (c) a reducing agent, (d) a binder, and (e) at least one compound represented by the general formula (I):



(I)

wherein X represents a halogen atom and R represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group, an acyl group, a carbamoyl group, a alkysulfonyl group, an arylsulfonyl group, an aralkylsulfonyl group or a heterocyclic residue.

4,546,076

ENZYMATIC PROCESS FOR THE DETERMINATION OF BETA-LACTAM ANTIBIOTICS

Jacques Degelaen, Genappe; Albert Loffet, and Jean-Pierre Durieux, both of Braine-le-Chateau, all of Belgium, assignors to U C B Societe Anonyme, Brussels, Belgium

Filed Jan. 31, 1983, Ser. No. 462,233

Claims priority, application United Kingdom, Feb. 1, 1982, 8202790

Int. Cl.[4] C12Q *1/36*

U.S. Cl. 435—24 17 Claims

1. An enzymatic process for the determination of a beta-lactam antibiotic in a biological liquid which comprises the steps of:

(1) incubating the liquid with the soluble D-alanyl-D-alanine-carboxypeptidase produced by Actinomadura R 39, said enzyme being immobilized on a water-insoluble support, said incubation being conducted under conditions allowing the beta-lactam antibiotic, if present in said liquid, to react with the enzyme to form an inactive and substantially irreversible equimolecular enzyme-antibiotic complex;

(2) separating the immobilized enzyme from the liquid and washing it;

(3) incubating the immobilized enzyme of step (2) with a substrate solution under conditions allowing the substrate to be hydrolyzed by the enzyme to form an amount of D-alanine corresponding to the residual enzymatic activity;

(4) determining the amount of D-alanine formed in step (3); and

(5) comparing the determination of step (4) with a standard to obtain the concentration of the antibiotic in the biological liquid.

4,546,077

LEUCINE DEHYDROGENASE AND A PROCESS FOR PRODUCTION THEREOF

Toshihisa Ohshima, and Kenji Soda, both of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Aug. 24, 1983, Ser. No. 525,905

Claims priority, application Japan, Aug. 24, 1982, 57-147399; Oct. 12, 1982, 57-179570

Int. Cl.[4] C12Q *1/32;* C12N *9/06;* C12R *1/07*

U.S. Cl. 435—26 19 Claims

1. A substantially pure leucine dehydrogenase derived from a microorganism having an optimum growth temperature in the range of 50° C. to 85° C., wherein said leucine dehydrogenase is capable of retaining 80% or more of its activity after being incubated in a buffer solution at about 70° C. for about 10 minutes.

4,546,078

POLYMER CONTAINING BIOCATALYST

Georg Manecke, and Udo Klussmann, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 550,159

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241829

Int. Cl.[4] C12P *33/00;* C12N *11/08*

U.S. Cl. 435—52 19 Claims

1. A biocatalyst comprising an effective amount of a microorganism which is of the species *Arthrobacter simplex, Aspergillus ochraceus, Bacillus sphaericus, Curvularia lunata, Flavobacterium dehydrogenans, Mycobacterium spec.,* or *Saccharomyces uvarum,* and which is immobilized on a copolymer of acrolein and 1-vinyl-2-pyrrolidone which is crosslinked by reaction with an alkylenedioxydiamine of the formula

$$H_2NO—(CH_2)_nONH_2$$

wherein n is a number of 2–12.

16. In the microbiological conversion of a steroid using a biocatalyst comprising a microorganism suspended on a substrate, the improvement wherein the biocatalyst is that of claim 1.

4,546,079

STREPTOMYCES SPECIES AND PROCESS FOR PRODUCING ANTIBIOTIC

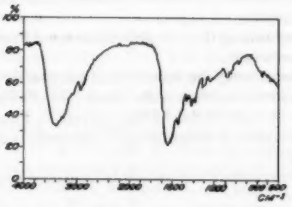
Karl G. Metzger; Jörg Pfitzner; Delf Schmidt, all of Wuppertal; Horst Weyland, Bremerhaven; Günter Benz, Velbert, and Theo Schröder, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 340,449, Jan. 18, 1982, Pat. No. 4,415,517. This application May 31, 1983, Ser. No. 499,653

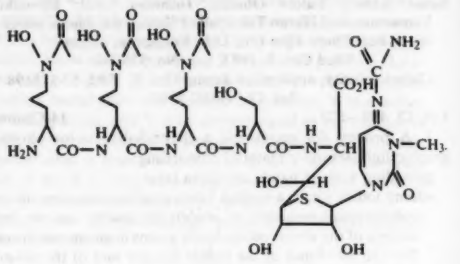
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102137

Int. Cl.[4] C12P *21/04;* C12R *1/545*

U.S. Cl. 435—71 20 Claims



1. A process for the production of an iron-containing or iron-free antibiotic compound which, in the iron-free form, is of the formula



4,546,080

MANUFACTURE OF HALOGENATED KETONES AND ALDEHYDES

Saul L. Neidleman, Oakland, and John Geigert, Clayton, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Jan. 29, 1981, Ser. No. 229,554

Int. Cl.[4] C12P *7/26, 7/24;* C12M *1/40*

U.S. Cl. 435—148 11 Claims

1. A method for producing alpha halogenated ketones and aldehydes from alkynes, comprising, providing in a reaction vessel a reaction mixture of a haloperoxidase enzyme, an oxidizing agent, and a halide ion source, introducing an alkyne into said reaction vessel, and maintaining said alkyne in contact with said reaction mixture for a sufficient period of time to convert said alkyne to an alpha-halo or alpha-dihalo ketone or aldehyde.

4,546,081

CONTINUOUS ALCOHOL FERMENTATION PROCESS USING IMMOBILIZED YEAST

Tomiaki Yamada, Yokohama; Tsuneo Sazanami, Yokosuka; Keiichiro Watanabe, Yokohama; Takamitsu Iida; Eiichi Hasegawa, both of Hiratsuka, and Masahiro Sakamoto, Kanagawa, all of Japan, assignors to JGC Corporation, Tokyo and Kansai Paint Co., Ltd., Amagasaki, both of, Japan

Continuation of Ser. No. 267,817, May 27, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 499,172

Claims priority, application Japan, May 30, 1980, 55-72586

Int. Cl.[4] C12P *7/06;* C12N *11/12, 11/08, 11/04*

U.S. Cl. 435—161 7 Claims

1. A continuous fermentation process for producing ethanol, utilizing a fermentation vessel through which liquid is adapted to flow in one direction, which comprises the steps of:

packing inside said fermentation vessel thin film means having a thickness of from 0.1 to 3 mm and containing immobilized living yeast so that the surfaces of said thin film means extend in said direction of liquid flow in said vessel, from 10 to 65% of the volume of said fermentation vessel is occupied by said thin film means and opposing surfaces of laterally adjacent portions of said thin film means are substantially parallel with and spaced from each other to provide elongated parallel passages therebetween, said passages extending in said direction of liquid flow and being parallel with the surfaces of said thin film means, said thin film means consisting essentially of immobilized living yeast mixed in an organic, film-forming, photo-crosslinked, resin carrier, said thin film means having been prepared by mixing an aqueous yeast suspension with photo-crosslinkable resin and then subjecting the thus-formed mixture to radiation having a wavelength of from 250 to 6000 Å to photo-crosslink said resin, said yeast being capable of fermenting a fermentable, carbohydrate-containing, substrate liquid to form an ethanol-containing, fermented liquid; flowing a fermentable, carbohydrate-

containing, substrate liquid through said fermentation vessel and through said passages in said direction of liquid flow so that said liquid substrate flows in parallel with and contacts the surfaces of said thin film means, under conditions and for a period of time effective to cause said substrate liquid to be fermented to form an ethanol-containing fermented liquid and so that impurities and carbon dioxide gas generated by the fermentation travel with the liquid in said direction of liquid flow; discharging the fermented liquid from said discharge opening and recovering ethanol from said fermented liquid.

4,546,082

E. COLI/SACCHAROMYCES CEREVISIAE PLASMID CLONING VECTOR CONTAINING THE ALPHA-FACTOR GENE FOR SECRETION AND PROCESSING OF HYBRID PROTEINS

Janet Kurjan, San Francisco, and Ira Herskowitz, Berkeley, both of Calif., assignors to Regents of the Univ. of California, Berkeley, Calif.

Filed Jun. 17, 1982, Ser. No. 389,560

Int. Cl.[4] C12N *15/00, 1/16, 1/18, 1/00;* **C12P** *21/00, 21/02, 21/04, 19/34;* **C07H** *21/02*

U.S. Cl. 435—172.3 **10 Claims**

1. A DNA expression vector capable of expressing in yeast cells a product which is secreted from said yeast cells, said vector comprising at least a segment of alpha-factor precursor gene and at least one segment encoding a polypeptide.

4,546,083

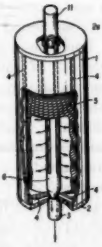
METHOD AND DEVICE FOR CELL CULTURE GROWTH

William E. Meyers, Helena, and Lee R. Beck, Birmingham, both of Ala., assignors to Stolle Research & Development Corporation, Cincinnati, Ohio

Filed Apr. 22, 1983, Ser. No. 487,824

Int. Cl.[4] C12N *5/00;* **C12M** *3/00*

U.S. Cl. 435—240 **20 Claims**



1. A method of cultivating cells in vitro which comprises:

culturing cells selected from the group consisting of cells of animal, vegetable, microbiological and artificial origin in a cell culture device comprising an elongated housing of impermeable material, closed at its ends by means of impermeable end plates, said housing on its interior having a plurality of axial ribs extending substantially throughout the length thereof, an inlet port in one of said end plates, an outlet port in the other end of said end plates, said ribs continuing radially in said other of said end plates, an impermeable spindle axially disposed in said housing and having axially disposed grooves in its periphery, a cylindrical port secured to one end of said spindle and in communication with said inlet port and with said grooves, said spindle at its other end terminating in a conical tip axially disposed with respect to said outlet port with an annular space therebetween, and a spool of fiber helically wound on said spindle to substantially fill the interior of said housing into said ribs, whereby fluid entering said inlet port flows along said spindle grooves, passes through said fibrous spool, flows alongside said housing between said ribs, and then between said conical tip and said outlet port, said fiber having attached thereon the cells.

4,546,084

BIOLOGICALLY PURE CULTURE OF ACTINOMADURA SP.

Masataka Konishi, Kawasaki; Fumihide Sakai; Takeo Miyaki, both of Yokohama, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 401,468, Jul. 26, 1982,. This application Apr. 9, 1984, Ser. No. 598,114

Int. Cl.[4] C12N *1/20;* **C12P** *21/00;* **C12R** *1/03*

U.S. Cl. 435—253 **1 Claim**

1. A biologically pure culture of the microorganism Actinomadura sp. ATCC 39144, said culture being capable of producing the antibiotic BBM-1644 in a recoverable quantity upon cultivation in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon.

4,546,085

CELL CULTIVATION CONTAINER

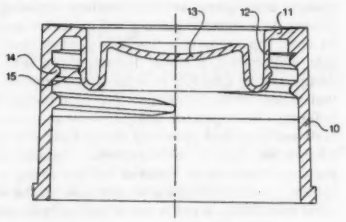
Arne Johansson, Roskilde, and Sven Ajslev, Kirke Hyllinge, both of Denmark, assignors to A/S Nunc, Roskilde, Denmark

Filed Nov. 15, 1982, Ser. No. 441,615

Claims priority, application Denmark, Nov. 16, 1981, 5076/81

Int. Cl.[4] C12M *3/00, 1/00, 1/24, 1/04;* **B65D** *51/16;* **B01L** *3/00*

U.S. Cl. 435—284 **2 Claims**



1. A cell cultivation device whose interior can be sealed with respect to exposure to the surrounding atmosphere or exposed to the surrounding atmosphere via a predetermined cross sectional area, said container device comprising

a container element which comprises a container portion defining the interior of said container element and a cylindrical neck portion which terminates in a mouth, said cylindrical neck portion defining an axis therethrough and providing a first zone adjacent to the mouth thereof and a second zone located between the first zone and the container portion, the neck portion along said first zone defining a larger inner diameter than the neck portion along said second zone, said container element also including at least two axially extending projections connected to the neck portion along said first zone so as to extend inwardly of said neck portion, and

a screw cover element for attachment to the cylindrical neck portion of said container element, said screw element defining an inner skirt with an outer annular bead, said screw cover element being dimensioned such that when fully tightened over the neck portion of said container element, said outer annular bead will be in sealing engagement with the neck portion of said container element along said second zone of said neck portion, while when in a partially unscrewed position said outer annular bead will engage only the inwardly protruding, axially extending projections connected to the neck portion along said first zone, such that a predetermined cross sectional area for exposure of the interior of said container element and the

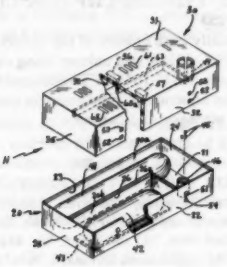
surrounding atmosphere is provided by said projections between the inner skirt of said screw cover element and the neck portion of said container element along said first zone to which said projections are attached.

4,546,086

MICROBIAL CULTURE APPARATUS

Melvin W. Hounsell, 6441 Alice La., Rockton, Ill. 61072

Filed Jan. 19, 1983, Ser. No. 459,048
Int. Cl.[4] C12M *1/00, 1/16;* **F01C** *1/00*
U.S. Cl. 435—287 **11 Claims**



1. A microbial culture apparatus for providing an anaerobic gaseous atmosphere around a culture retaining container comprising, an anaerobic gassing and indicator apparatus including an open top receptacle having a bottom wall and upstanding side wall means, a cover having a top wall and depending flange means adapted to extend downwardly along the side wall means of the receptacle, partition means in the receptacle defining a first open top compartment at one area of the bottom wall and a second open top compartment at a second area of the bottom wall, a first rupturable container in the first compartment containing material for providing a gaseous atmosphere, a second rupturable container in the second compartment containing a redox color indicator liquid, interengaging detent means on the receptacle side wall means and cover flange means for releasably retaining the cover in a first position on the receptacle with the top wall of the cover spaced above the partition wall means of the receptacle a distance to retain the first and second containers in their respective first and second compartments without rupturing the containers, the interengaging detent means being releasable in response to downward pressure on the cover to allow the cover to move down to a second position on the receptacle, means operative in response to movement of the cover from its first to its second position on the receptacle for rupturing said first and second rupturable containers, vent means for venting the first and second compartments when the cover is in its second position, and outer enclosure means for providing a sealed enclosure around a culture retaining container and the anaerobic gassing and indicator apparatus.

4,546,087

METHOD FOR DETECTING THE PRESENCE OF A CHROMATE COATING ON ALUMINUM

Lance K. Wilson, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 29, 1982, Ser. No. 437,702
Int. Cl.[4] G01N *21/78, 33/18*
U.S. Cl. 436—5 **4 Claims**

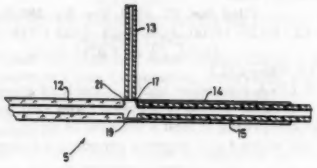
1. A method for detecting the presence of a chromate coating on the surface of an aluminum part, said method comprising applying to the surface of said aluminum part a few milliliters of a liquid composition comprising from one to two parts of an aqueous solution of potassium permanganate having a concentration of at least 0.5 weight/volume percent with one to three parts of a concentrated sodium hydroxide solution, said liquid composition having a beet-red pigmentation, whereby any chromate coating present on the surface of said aluminum part will react with said liquid composition to produce a color change to a bright blue-green pigmentation.

4,546,088

PROCESS FOR FLOW INJECTION EXTRACTION

Bo I. Karlberg, and Sidsel Thelander, both of Södertälje, Sweden, assignors to Bifok AB, Sweden

Division of Ser. No. 232,214, Feb. 6, 1981, Pat. No. 4,399,102, which is a continuation of Ser. No. 948,629, Oct. 3, 1978, abandoned. This application Apr. 4, 1983, Ser. No. 482,054
Claims priority, application Sweden, Oct. 3, 1977, 7711016
Int. Cl.[4] G01N *1/00, 35/08*
U.S. Cl. 436—178 **13 Claims**



1. An extraction method comprising the steps of:

flowing a first non-gas segmented liquid through a first inlet tube;

flowing a second non-gas segmented liquid through a second inlet tube, said second liquid being immiscible in said first liquid;

introducing a sample plug into said flowing first liquid, said sample including one or more extractable substances being more soluble in said second liquid than said first liquid;

introducing said second liquid into said first liquid to segment said first liquid into an extraction stream having alternating segments of said first and second liquids wherein introducing said second liquid into said first liquid includes connection of said first inlet tube and said extraction conduit at a juncture in flow communication and co-linear, said second inlet tube joining said first inlet tube and extraction conduit at said juncture, the cross-sectional area of said second inlet tube being less than the cross-sectional area of said first inlet tube and the cross-sectional area of said extraction conduit being less than the sum of the cross-sectional areas of said first and second inlet tubes, and a cavity at said juncture having a cross-sectional area larger than the first inlet tube, second inlet tube or extraction conduit.

4,546,089

GROUP 4B BORIDE AND VB_2/YB_2

Raja R. Wusirika, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,720
Int. Cl.[4] C04C *35/58*
U.S. Cl. 501—96 **11 Claims**

1. A sinterable powder having a particle size substantially less than 5 μm, consisting of about 2 to 10 mole % of diboride of vanadium or yttrium, optionally very small amounts of oxygen and carbon, and the balance diboride of Group 4b metal, and being sinterable into a body having density approaching theoretical density of the composition and 0–5 volume % open porosity.

4,546,090

HOLLOW ZEOLITE-CONTAINING PARTICLES USEFUL AS REFINING CATALYSTS

Paul B. Olson, St. Paul; Richard M. Minday, Stillwater, both of Minn., and Julian B. Cooley, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 27, 1983, Ser. No. 489,256

Int. Cl.[4] B01J *29/04*

U.S. Cl. 502—69 **5 Claims**

1. Hollow particles comprising a solidified peripheral shell that defines and encloses a hollow space within the interior of said shell, said peripheral shell being a composite structure that comprises a zeolite promoted catalyst composition comprising zeolite promoter dispersed in inorganic matrix material, said particles being capable of being essentially completely decoked upon regeneration.

5. The particles of claim **1** wherein the matrix material comprises from about 50 to about 98 percent by weight of the shell and the zeolite promoter comprises from about 2 to about 50 percent by weight of the shell.

4,546,091

CATALYSTS

Christine M. Sheppard, London; David C. Puxley, Beckenham; Reginald G. S. Banks, Solihull, and Donald McKenzie, London, all of England, assignors to British Gas Corporation, London, England

Filed May 10, 1984, Ser. No. 608,854

Claims priority, application United Kingdom, May 12, 1983, 8313123

Int. Cl.[4] B01J *21/16*

U.S. Cl. 502—84 **15 Claims**

1. A catalyst composition comprising interstratified layers of a coprecipitated Feitknecht compound and a clay mineral containing phyllosilicate layers, said Feitknecht compound having the general formula:

$$Me^{2+}{}_xMe^{3+}{}_y(OH)_{2x+3y-2z}(A^{2-})_z.nH_2O$$

wherein Me^{2+} is a divalent metal cation; Me^{3+} is trivalent metal cation; A^{2-} is either a single divalent anion or two monovalent anions, and the ratio of x/y is between 1.5/1 to 4/1.

4. A catalyst as claimed in claim **1**, **2** or **3** in which Me^{2+} is nickel (II) and/or magnesium and Me^{3+} is aluminium or chromium (III).

4,546,092

PROCESS OF PREPARING A SOLID CATALYTIC TITANIUM COMPONENT AND PROCESS FOR THE POLYMERIZATION OF 1-ALKENES USING SUCH A TITANIUM COMPONENT

Jacobus A. Loontjens, Meerssen, and Bernardus J. Muskens, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Licensing Subsidiary of DSM, Geleen, Netherlands

Continuation-in-part of Ser. No. 486,002, Apr. 14, 1983, abandoned. This application Aug. 23, 1983, Ser. No. 525,825

Claims priority, application Netherlands, Apr. 15, 1982, 8201574; European Pat. Off., Apr. 13, 1983, 83200525.0; Canada, Apr. 14, 1983, 425825

Int. Cl.[4] C08F *4/64*

U.S. Cl. 502—105 **25 Claims**

1. A process for preparing a solid titanium-containing catalyst component useful for homo-polymerizing 1-alkenes and for co-polymerizing 1-alkenes with each other and/or with ethylene comprising:

A. forming a complex by contacting a titanium halide compound with an electron donor compound;

B. forming a magnesium aluminum halide by precipitation from an organic solvent;

C. forming a ground product by grinding said complex with said magnesium aluminum halide;

D. washing said ground product with a washing liquid containing a solvent which removes aluminium halide and electron donor; and

E. contacting said washed product with a liquid titanium halide compound to form a finished titanium catalyst component.

4,546,093

PREPARATION OF CATALYST SYSTEM FOR THE SYNTHESIS OF 2-6-XYLENOL

Kong R. Chang, and Trong G. Lin, both of Taichung, Taiwan, assignors to China Petrochemical Development Corp., Taipei, Taiwan

Filed Jul. 5, 1984, Ser. No. 628,103

Int. Cl.[4] B01J *23/34, 27/24, 27/02*

U.S. Cl. 502—324 **7 Claims**

1. A process for the preparation of a catalyst system used for synthesizing 2,6-xylenol, which comprises:

A. mixing manganic, ferric, and zinc salts to have atomic ratios of Mn:Fe:Zn from 90:20:20 to 99:0.01:0.01 in a water solution;

B. adding an aqueous alkaline solution to said solution of step A until the PH value is 9 for co-precipitation of hydroxides of Mn, Fe and Zn;

C. treating the precipitates by filtration, water washing and drying the washed precipitates at 160° C. to form oxides of Mn, Fe and Zn; and

D. extrusion and granulation of said oxide mixture by calcination at 300°–650° C. under incoming air flow for 3 hours to activate the catalyst system.

4,546,094

SOLID ADSORBENT FOR UNSATURATED HYDROCARBON AND PROCESS FOR SEPARATION OF UNSATURATED HYDROCARBON FROM GAS MIXTURE

Hidefumi Hirai, 14-10, Yutenji 1-chome, Meguro-ku, Tokyo; Makoto Komiyama, and Susumu Hara, both of Tokyo, all of Japan, assignors to Hidefumi Hirai, Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,657

Claims priority, application Japan, Mar. 16, 1983, 58-043650; Apr. 27, 1983, 58-074691; May 18, 1983, 58-086949; Jan. 7, 1984, 59-001161; Jan. 7, 1984, 59-001162; Jan. 7, 1984, 59-001163

Int. Cl.[4] B01J *20/26;* **B01D** *53/02;* **C07C** *7/12*

U.S. Cl. 502—402 **7 Claims**

1. A solid adsorbent for an unsaturated hydrocarbon comprising:

(a) (i) a silver or copper(I) halide,

(ii) a silver or copper(I) halide and 0.1 to 10 times by mole, based on the amount of the silver or copper(I) halide, of a calcium or magnesium halide, or

(iii) a silver or copper(I) halide and 0.1 to 10 times by mole, based on the amount of silver or copper(I) halide, of an aluminum halide, and

(b) polystyrene having a number-average molecular weight of 5000 to 500,000 or a styrene copolymer of 40 to 99 moles of styrene and 1 to 60 moles % of divinylbenzene in an amount such that the mole ratio of a monomer residual group of the polystyrene or styrene copolymer to the silver or copper(I) halide is 0.1 to 30,

said solid adsorbent being prepared by mixing the components (a) and (b) in a solvent, followed by evaporating the solvent form the mixture.

6. A solid adsorbent comprising (a)(i) or (a)(ii) and (b) as claimed in claim **1**, wherein the solvent is carbon disulfide, dichloromethane, chloroform, tetrachloromethane, dichloroethane, trichloroethane, tetrachloroethane, benzene, toluene, xylene, chlorobenzene, cyclohexane, decalin, acetonitrile, propionitrile, acetone, methyl isobutyl ketone, ethyl acetate, water, an aqueous hydrogen halide solution, methanol, ethanol, or isopropanol.

7. A solid adsorbent comprising (a)(iii) and (b) as claimed in claim 1, wherein solvent is carbon disulfide, dichloromethane, chloroform, tetrachloromethane, dichloroethane, trichloroethane, tetrachloroethane, benzene, toluene, xylene, chlorobenzene, cyclohexane, or decalin.

4,546,095

USE OF FRUCTOSE-1,6-DIPHOSPHATE FOR TREATING MYOCARDIAL INFARCTION

Angel K. Markov, 353 Northside Cir., Jackson, Miss. 39206

Continuation of Ser. No. 170,614, Jul. 21, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,551

Int. Cl.⁴ A61K *31/66, 31/70;* **C12P** *19/24*

U.S. Cl. 514—23 **5 Claims**

1. A method for treating a mammalian subject experiencing myocardial infarction to preserve the subject's ischemic tissue from irreversible tissue damage, comprising:

administering intravenously to the subject fructose-1,6-diphosphate in an amount of at least 50 mg/kg subject body weight and less than 5 g/kg subject body weight.

4,546,096

ANTICHOLINERGIC GLUCURONIDES AND ANTIPERSPIRANT USE THEREOF

Walter C. Herlihy; David M. Epstein, both of Middlesex County, Mass., and Carl B. Felger, Prince George County, Md., assignors to Repligen Corporation, Cambridge and The Gillette Company, Boston, both of, Mass.

Filed Feb. 24, 1984, Ser. No. 583,111

Int. Cl.⁴ A61K *31/70;* **C07H** *15/00*

U.S. Cl. 514—25 **17 Claims**

15. The process of inhibiting perspiration which comprises the step of applying to the human body a composition comprising from about 0.01% to about 2% by weight of an antiperspirant compound selected from the group consisting of the 1-O-β-D-glucuronic acid of an anticholinergic compound that possesses a single phenolic moiety; and base addition salts thereof, incorporated into a dermatologically acceptable carrier.

4,546,097

SAPONIN-BASED POLYETHER POLYOLS, PHARMACEUTICAL COMPOSITIONS AND A METHOD OF USING SAME

Josef Pitha, Baltimore, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Nov. 4, 1983, Ser. No. 548,849

Int. Cl.⁴ A61K *31/705;* **C07J** *17/00*

U.S. Cl. 514—26 **21 Claims**

1. A saponin-based polyether polyol having substitution of free hydroxyl groups in said polyol with an average of about 0.5 to 2 oxyalkylene groups per molecule of saponin and having the following properties:

increased LD_{50} compared to that of digitonin;

decreased ability to precipitate cholesterol to at least a quarter of that of digitonin; and

clear stability in water to a concentration of at least 10 g per liter; wherein said polyether polyol is selected from the group consisting of digitonin, digalonin, desglucodigitonin, gitonin, tigonin, digitonin-d' and mixture thereof.

19. A method of administering a lipophilic pharmaceutical comprising admixing the pharmaceutical with a saponin-based polyether polyol according to claim 1, and parenterally or orally administering the admixture wherein said pharmaceutical is selected from the group consisting of β-ionene, retinol, β-carotene, lycopene, vitamin D, naphthalene, anthracene, 2,3-benzanthracene, and vitamin A.

4,546,098

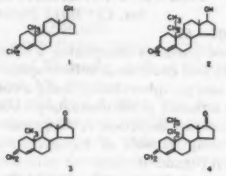
ESTROGEN SYNTHESIS INHIBITORS

Jack Fishman, and Shinichi Mayairi, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

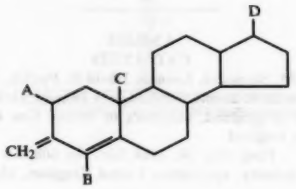
Filed Apr. 13, 1984, Ser. No. 600,164

Int. Cl.⁴ A61K *31/56;* **C07J** *1/00*

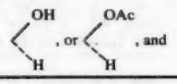
U.S. Cl. 514—177 **15 Claims**



1. A compound selected from the group consisting of compounds represented by the formula:



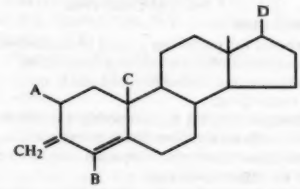
and the corresponding Δ^1 and $\Delta^{1,6}$ compounds wherein:

A is H or β —OH
B is H or OH
C is —CH_2OH, —CHO, —CH=CH_2, —C≡CH, —$CH_2C{\equiv}CH$, —CH_3, —CH_2CH_3,
D is =O, 

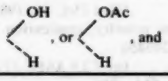
Ac is an acyl group containing only carbon, hydrogen and oxygen up to a total of six carbon atoms, provided that

1. A and B are not hydroxyl on the same molecule,
2. When there is a double bond at the 1,2-position, the group substituted at the 10-position does not contain an oxygen atom,
3. When the only double bond is at the 4,5-position and A and B are both hydrogen, C is not methyl or ethyl,
4. When there are double bonds at the 1,2 and 6,7-positions or at the 6,7-position, C is methyl or ethyl,
5. When C is —CHO, A and B are both hydrogen and the only double bond is at the 4,5-position.

2. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound selected from the group consisting of compounds represented by the formula:



and the corresponding $\Delta^{1,4}$,$\Delta^{4,6}$ and $\Delta^{1,4,6}$ compounds wherein:

A is H or β —OH
B is H or OH
C is —CH_2OH, —CHO, —CH=CH_2, —C≡CH, —$CH_2C{\equiv}CH$, —CH_3, —CH_2CH_3,
D is =O, 

Ac is an acyl group containing only carbon, hydrogen and oxygen up to a total of six carbon atoms, provided that:

1. A and B are not hydroxyl on the same molecule,
2. When there is a double bond at the 1,2-position, the group substituted at the 10-position does not contain an oxygen atom,
3. When the only double bond is at the 4,5-position and A and B are both hydrogen, C is not methyl or ethyl,
4. When there are double bonds at the 1,2- and 6,7-position or at the 6,7-position, C is methyl or ethyl,
5. When C is —CHO, A and B are both hydrogen and the only double bond is at the 4,5-position.

4,546,099

N-AMINOMETHYL-3-PHENYL-4-CYANOPYRROLE DERIVATIVES, COMPOSITIONS AND USE THEREOF AS MICROBICIDES

Robert Nyfeler, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

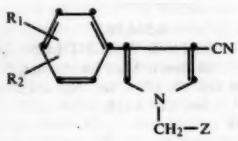
Filed Jul. 18, 1984, Ser. No. 632,168

Claims priority, application Switzerland, Jul. 22, 1983, 4031/83

Int. Cl.⁴ A01N *43/36, 43/84;* **C07D** *207/34, 413/06*

U.S. Cl. 514—212 **9 Claims**

1. A compound of the formula I

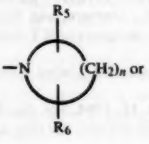

(I)

wherein

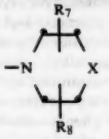
R_1 and R_2 are each independently hydrogen, halogen, methoxy or methylthio,

Z is a group

(a)


(b)

-continued


(c)

wherein

R_3 and R_4 are each independently hydrogen, C_1–C_6alkyl which is unsubstituted or substituted by cyano, C_1–C_6alkoxy or C_1–C_6alkoxycarbonyl; or are C_3–C_6alkenyl, C_3–C_6alkynyl, C_3–C_7cycloalkyl, benzyl or benzyl which is substituted by halogen, C_1–C_6alkyl, C_1–C_6haloalkyl and/or C_1–C_6alkoxy, or phenyl or phenyl which is substituted by halogen, C_1–C_6alkyl, C_1–C_6haloalkyl and/or C_1–C_6alkoxy, with the proviso that only one of R_3 or R_4 may be hydrogen,

R_5 and R_6 are each independently hydrogen, C_1–C_6alkyl, C_1–C_6alkoxycarbonyl, or both taken together form a fused aromatic ring,

n is 4 or 5,

X is oxygen, sulfur, >C=O or >N-R_9

R_7 and R_8 are each independently hydrogen, C_1–C_6alkyl or C_1–C_6alkoxycarbonyl, and

R_9 is hydrogen, C_1–C_6alkyl, formyl, C_1–C_6alkanoyl or C_1–C_6alkoxycarbonyl.

7. A microbicidal composition for controlling phytopathogenic microorganisms or for protecting living plants from attack by such microorganisms and/or for preserving perishable storable goods of vegetable or animal origin, which composition contains at least one compound of the formula I according to claim 1 and a carrier.

4,546,100

PYRROLO[1,2-C]THIAZOLES USEFUL AS ANTITHROMBOTIC AGENTS

Jean-Louis Fabre, Paris; Daniel Farge, Thiais; Claude James, and Daniel Lavé, both of Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

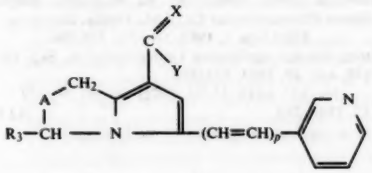
Filed Jan. 11, 1984, Ser. No. 569,907

Claims priority, application France, Jan. 13, 1983, 83 00454

Int. Cl.⁴ C07D *401/08;* **A61K** *31/44*

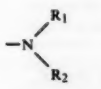
U.S. Cl. 514—231 **12 Claims**

1. A heterocyclic compound of the formula:



which A represents —S—, —SO—, or —SO_2—, R_3 represents hydrogen, alkyl or phenyl unsubstituted or substituted by halogen, alkyl, alkoxy or trifluoromethyl, and

(a) X represents oxygen, sulphur, imino or hydroxyamino p represents 0 or 1 and Y represents a radical of the formula:


(II)

in which R_1 and R_2 both represent hydrogen, or R_1 represents hydrogen and R_2 represents hydroxyl or alkyl of 1 to

5 carbon atoms, which is substituted by a carboxyl, amino, alkylamino, dialkylamino, hydroxyalkyl-amino, morpholino or imidazolyl, a piperazin-1-yl radical (unsubstituted or substituted in the 4-position by alkyl, benzyl optionally substituted by halogen, alkyl, alkoxy or trifluoromethyl, or phenyl optionally substituted by halogen, alkyl, alkoxy or trifluoromethyl) or a piperidino or pyrrolidin-1-yl radical, or R_2 represents phenyl substituted by one or more hydroxyl, carboxyl, amino, alkylamino or dialkylamino radicals, or R_1 and R_2 form, with the nitrogen atom to which they are bonded, a piperazino, piperidino, or morpholino ring which is unsubstituted or substituted by alkyl, alkoxycarbonyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl or dialkylaminoalkyl, a benzyl radical (optionally substituted by a halogen atom or an alkyl, alkoxy or trifluoromethyl radical) or a pyrrolin-1-yl carbonylalkyl radical, or

(b) X represents dialkylhydrazono, Y represents amino and p represents 0 or 1, or

(c) X and Y form with the carbon atom to which they are bonded, a Δ2-thiazolin-2-yl or Δ2-imidazolin-2-yl radical and p represents 0 or 1, or

(d) X represents oxygen, Y represents hydrogen and p is 0, the said alkyl radicals and alkyl portions being straight-chain or branched-chain and, unless stated otherwise, containing 1 to 4 carbon atoms each, and the tautomeric forms of the compounds where X represents imino, hydroxyimino or dialkylhydrazono and Y represents a radical of the formula (II) in which R_1 represents a hydrogen atom, or where X represents oxygen of sulphur and Y represents a radical of the general formula (II) in which R_1 represents hydrogen and R_2 represents hydroxyl; and its addition salts with acids and, where they exist, its metal salts and its addition salts with nitrogen-containing bases.

4,546,101

NEW CEPHEM COMPOUNDS USEFUL FOR TREATING INFECTIOUS DISEASES IN HUMAN BEING AND ANIMALS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi, Hamagutinishi; Hideaki Yamanaka, Hirakata; Kenji Miyai, Kawanishi, and Yoshikazu Inoue, Amagasaki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

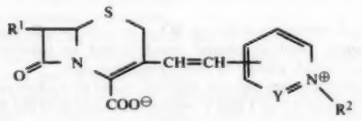
Filed Sep. 2, 1983, Ser. No. 528,796

Claims priority, application United Kingdom, Sep. 10, 1982, 8225836; Apr. 29, 1983, 8311815

Int. Cl.⁴ A61K *31/54;* **C07D** *501/00, 501/14*

U.S. Cl. 514—253 **12 Claims**

1. New cephem compounds of the formula:



wherein

R^1 is carboxylic acylamino,

R^2 is lower alkyl, and

Y is CH or N,

and pharmaceutically acceptable salts thereof.

10. A method for producing an antimicrobial pharmaceutical composition which comprises mixing a compound of claim 1 or pharmaceutically acceptable salt thereof as an active ingredient with an inert carrier.

4,546,102

1-(6,7-DIMETHOXYQUINAZOL-4-YL)SEMICARBAZIDES

Ernst-Otto Renth, Ingelheim; Anton Mentrup, Mainz-Kastel; Kurt Schromm, Ingelheim; Werner Traunecker, Münster-Sarmsheim, and Richard Reichl, Gau-Algesheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

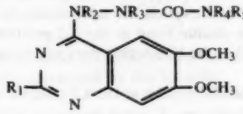
Filed Oct. 31, 1983, Ser. No. 546,864

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240456

Int. Cl.⁴ A61K *31/505;* **C07D** *239/94*

U.S. Cl. 514—259 **6 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms or trifluoromethyl;

R_2, R_3 and R_4 are each independently hydrogen, methyl or ethyl;

R_5 is hydrogen; alkyl of 1 to 8 carbon atoms; phenyl-(alkyl of 1 to 8 carbon atoms); cycloalkyl of 3 to 7 carbon atoms; (alkoxy of 1 to 4 carbon atoms) carbonyl methyl; phenyl; phenyl substituted by one to three identical or different substituents selected from the group consisting of methyl, ethyl, methoxy, ethoxy, fluorine, chlorine, bromine and CF_3; naphthyl or naphthyl substituted by one to three identical or different substituents selected from the group consisting of methyl, ethyl, methoxy, ethoxy, fluorine, chlorine, bromine and CF_3; and

R_4 and R_5, together with each other, are alkylene of 4 to 5 carbon atoms optionally interrupted by —O— or —NR_6—, where R_6 is alkyl of 1 to 4 carbon atoms; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

6. The method of increasing the cardiac output of a warm-blooded animal in need thereof, which comprises perorally or parenterally administering to said animal an effective cardiotonic amount of a compound of claim 1.

4,546,103

METHOD OF TREATING WEIGHT LOSS DISORDERS

Hans F. Huebner, 106 Beach Ave., Larchmont, N.Y. 10538

Filed Sep. 18, 1984, Ser. No. 651,594

Int. Cl.⁴ A61K *31/44*

U.S. Cl. 514—282 **11 Claims**

1. A method of treating weight loss disorders consisting essentially of administering to a human having a weight loss disorder a daily dosage of an effective amount which consists essentially of at least about 10 milligrams per 37 kilogram body weight of at least one opiate antagonist selected from the group consisting of naloxone, naltrexone, nalorphine, diprenorphine, levallorphan, pentazocine, metazocine, cyclozocine, etazocine, and pharmacologically acceptable salts thereof.

4,546,104

PYRAZOLOPYRIDINE CYCLOALKANONES AND PROCESS FOR THEIR PREPARATION

James B. Campbell, Jr., Malvern, and Thomas M. Bare, West Chester, both of Pa., assignors to ICI Americas Inc., Wilmington, Del.

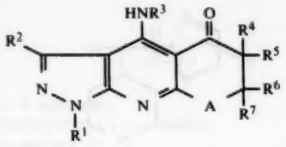
Claims priority, application United Kingdom, Nov. 4, 1983, 8329531

Filed Oct. 11, 1984, Ser. No. 659,615

Int. Cl.⁴ C07D *471/04, 231/38;* **A61K** *31/47*

U.S. Cl. 514—293 **12 Claims**

1. A compound of formula I as follows:



1

wherein

A is a direct link; or a divalent radical having the formula $(CR^8R^9)_n$;

n=1 or 2;

R^1 is hydrogen; an alkyl of 1 to 10 carbons optionally substituted independently by a member selected from a group consisting of hydroxy, cyano, oxo and alkoxy having 1 to 6 carbons, or by one to three member(s) selected from a group consisting of halogen, an alkyl having 1 to 6 carbons, and a halogenoalkyl substituted by 1 to 3 halogens; a cycloalkyl of 3 to 8 carbons; a cycloalkylalkyl of 4 to 12 carbons; an alkenyl or alkynyl of 2 to 10 carbons, optionally substituted independently by 1 to 3 member(s) selected from a group consisting of halogen and an alkyl of 1 to 6 carbons; an aryl of 6 to 10 carbons optionally substituted independently by one or two member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkyl of 1 to 6 carbons substituted by one or more fluoros, and an alkoxy of 1 to 6 carbons; an arylalkyl having 6 to 10 carbons in the aryl and 1 to 4 carbons in the alkyl, wherein said aryl portion may optionally be substituted independently by 1 or 2 member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkyl of 1 to 6 carbons substituted by one or more fluoros, and an alkoxy of 1 to 6 carbons;

R^2 is hydrogen; or an alkyl of 1 to 6 carbons;

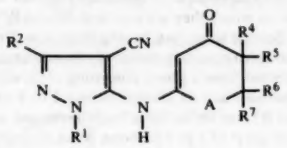
R^3 is hydrogen; an alkyl of 1 to 6 carbons optionally substituted by a member selected from a group consisting of hydroxy and oxo; an alkanoyl of 2 to 6 carbons; or an aroyl of 6 to 10 carbons;

R^4 and R^5, may be the same or different and are each hydrogen; an alkyl of 1 to 10 carbons optionally substituted independently by one or two member(s) selected from a group consisting of hydroxy, oxo, alkoxy of 1 to 6 carbons, an alkyl of 1 to 6 carbons, and a halogenoalkyl having 1 to 6 carbons and 1 to 3 halogens; a cycloalkyl of 3 to 8 carbons; a cycloalkylalkyl of 4 to 10 carbons; an alkenyl or alkynyl of 3 to 10 carbons optionally substituted independently by 1 to 3 member(s) selected from a group consisting of an alkyl of 1 to 6 carbons and halogen; a cycloalkenyl of 4 to 8 carbons optionally substituted independently by 1 or 2 member(s) selected from a group consisting of halogen and an alkyl having 1 to 6 carbons; a cycloalkenylalkyl wherein the cycloalkenyl portion has 4 to 8 carbons and the alkyl portion has 1 to 3 carbons, optionally substituted independently in the cycloalkenyl portion by 1 or 2 member(s) selected from a group consisting of an alkyl of 1 to 6 carbons; an aryl of 6 to 10 carbons optionally substituted independently by a member selected from a group consisting of nitro, cyano, an alkoxycarbonyl of 2 to 7 carbons, and a mono or dialkyl-substituted amino of 1 to 6 carbons in each alkyl, or by 1 or 2 member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkanoyl of 1 to 6 carbons, an alkoxy of 1 to 6 carbons, amino and a halogenoalkyl having 1 to 6 carbons and 1 to 3 of halogen; an arylalkyl having 6 to 10 carbons in the aryl portion and 1 to 4 carbons in the alkyl wherein the aryl portion is optionally substituted independently by a member selected from a group consisting of nitro, cyano, an alkoxycarbonyl of 2 to 7 carbons, and a mono or dialkyl-substituted amino of 1 to 6 carbons in each alkyl, or by 1 or 2 member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkanoyl of 1 to 6 carbons, an alkoxy of 1 to 6 carbons, an amino and a halogenoalkyl having 1 to 6 carbons and 1 to 3 of halogen; an alkanoyl of 1 to 6 carbons; or an aryl (oxo-substituted-)alkyl of 7 to 12 carbons; or, when taken together with the carbon atom to which they are attached, R^4 and R^5 may be selected to form a spiro ring having from 4 to 7 carbons wherein said spiro ring may optionally be substituted by a member selected from a group consisting of an alkyl having 1 to 6 carbons and an alkenyl having 2 to 6 carbons;

R^6, R^7, R^8 and R^9 may be the same or different and are each hydrogen; an alkyl of 1 to 6 carbons; or an alkenyl of 2 to 6 carbons;

and a pharmaceutically acceptable salt thereof.

10. A compound of formula IV:



IV

wherein

A is a direct link; or a divalent radical having the formula $(CR^8R^9)_n$;

n=1 or 2;

R^1 is hydrogen; an alkyl of 1 to 10 carbons optionally substituted independently by a member selected from a group consisting of hydroxy, cyano, oxo and alkoxy having 1 to 6 carbons, or by one to three member(s) selected from a group consisting of halogen, an alkyl having 1 to 6 carbons, and a halo-genoalkyl substituted by 1 to 3 halogens; a cycloalkyl of 3 to 8 carbons; a cycloalkylalkyl of 4 to 12 carbons; an alkenyl or alkynyl of 2 to 10 carbons, optionally substituted independently by 1 to 3 member(s) selected from a group consisting of halogen and an alkyl of 1 to 6 carbons; an aryl of 6 to 10 carbons optionally substituted independently by one or two member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkyl of 1 to 6 carbons substituted by one or more fluoros, and an alkoxy of 1 to 6 carbons; an arylalkyl having 6 to 10 carbons in the aryl and 1 to 4 carbons in the alkyl, wherein said aryl portion may optionally be substituted independently by 1 or 2 member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkyl of 1 to 6 carbons substituted by one or more fluoros, and an alkoxy of 1 to 6 carbons;

R^2 is hydrogen; or an alkyl of 1 to 6 carbons;

R^4 and R^5, may be the same or different and are each hydrogen; an alkyl of 1 to 10 carbons optionally substituted independently by one or two member(s) selected from a group consisting of hydroxy, oxo, alkoxy of 1 to 6 carbons, an alkyl of 1 to 6 carbons, and a halogenoalkyl having 1 to 6 carbons and 1 to 3 halogens; a cycloalkyl of 3 to 8 carbons; a cycloalkylalkyl of 4 to 10 carbons; an alkenyl or alkynyl of 3 to 10 carbons optionally substituted independently by 1 to 3 member(s) selected from a group consisting of an alkyl of 1 to 6 carbons and halogen; a cycloalkenyl of 4 to 8 carbons optionally substituted independently by 1 or 2 member(s) selected from a group consisting of halogen and an alkyl having 1 to 6 carbons; a cycloalkenylalkyl wherein the cycloalkenyl portion has 4 to 8 carbons and the alkyl portion has 1 to 3 carbons, optionally substituted independently in the cycloalkenyl portion by 1 or 2 member(s) selected from a group consisting of an alkyl of 1 to 6 carbons; an aryl of 6 to 10 carbons optionally substituted independently by a member selected from a group consisting of nitro, cyano, an alkoxycarbonyl of 2 to 7 carbons, and a mono or dialkyl-substituted amino of 1 to 6 carbons in each alkyl, or by 1 or 2 member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkanoyl of 1 to 6

carbons, an alkoxy of 1 to 6 carbons, amino and a halogenoalkyl having 1 to 6 carbons and 1 to 3 of halogen; an arylalkyl having 6 to 10 carbons in the aryl portion and 1 to 4 carbons in the alkyl wherein the aryl portion is optionally substituted independently by a member selected from a group consisting of nitro, cyano, an alkoxycarbonyl of 2 to 7 carbons, and a mono or dialkylsubstituted amino of 1 to 6 carbons in each alkyl, or by 1 or 2 member(s) selected from a group consisting of halogen, hydroxy, an alkyl of 1 to 6 carbons, an alkanoyl of 1 to 6 carbons, an alkoxy of 1 to 6 carbons, an amino and a halogenoalkyl having 1 to 6 carbons and 1 to 3 of halogen; an alkanoyl of 1 to 6 carbons; or an aryl (oxo-substituted-)alkyl of 7 to 12 carbons; or, when taken together with the carbon atom to which they are attached, R^4 and R^5 may be selected to form a spiro ring having from 4 to 7 carbons wherein said spiro ring may optionally be substituted by a member selected from a group consisting of an alkyl having 1 to 6 carbons and an alkenyl having 2 to 6 carbons;

R^6, R^7, R^8 and R^9 may be the same or different and are each hydrogen; an alkyl of 1 to 6 carbons; or an alkenyl of 2 to 6 carbons.

11. A pharmaceutical composition comprising a compound of claim **1** in an amount sufficient to affect anxiolytic activity in a warm blooded animal in association with a non-toxic pharmaceutically-acceptable diluent or carrier.

4,546,105

PYRROLYLAMINOPIPERIDINES, COMPOSITIONS THEREOF AND METHODS OF USE

Richard C. Effland, and Joseph T. Klein, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

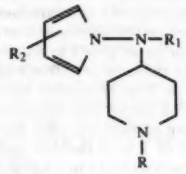
Filed Sep. 4, 1984, Ser. No. 647,309

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

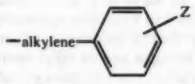
Int. Cl.[4] **A61K** *31/445;* **C07D** *401/12*

U.S. Cl. 514—334 **24 Claims**

1. A compound having the formula

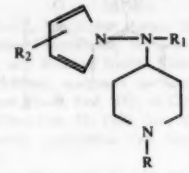


where R is Arloweralkyl of the formula

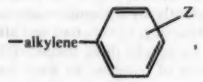


where Z is hydrogen, loweralkyl, loweralkoxy, halogen, CF_3, NH_2, cycloalkylloweralkyl, loweralkenyl or thienylloweralkyl; R_1 is loweralkylcarbonyl, loweralkoxycarbonyl, loweralkylthiocarbonyl, or cycloalkylcarbonyl; R_2 is hydrogen, halogen or $—CH_3$; and the pharmaceutically acceptable addition salts thereof.

17. A method of alleviating pain in a mammal which comprises administering to a mammal in need thereof an effective pain relieving amount of a compound having the formula



where R is loweralkyl, Arloweralkyl of the formula



where Z is hydrogen, loweralkyl, loweralkoxy, halogen, CF_3, NO_2, NH_2, cycloalkylloweralkyl, loweralkenyl or thienylloweralkyl; R_1 is loweralkylcarbonyl, loweralkoxycarbonyl, loweralkylthiocarbonyl, or cycloalkylcarbonyl; R_2 is hydrogen, halogen or $—CH_3$; and the pharmaceutically acceptable addition salt thereof.

4,546,106

ANTI-INFLAMMATORY 2-METHYL-3-HYDROXY-4-ALKENOYLTHIOMETHYL-5-VINYL-PYRIDINE DERIVATIVES

Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

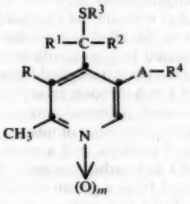
Division of Ser. No. 172,104, Jul. 25, 1980, Pat. No. 4,355,034, which is a division of Ser. No. 10,099, Feb. 7, 1979, Pat. No. 4,217,352, which is a division of Ser. No. 842,692, Oct. 17, 1977, Pat. No. 4,144,342, which is a division of Ser. No. 706,033, Jul. 6, 1976, Pat. No. 4,061,759, which is a division of Ser. No. 578,692, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,011, Apr. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,772, Jun. 15, 1973, abandoned. This application Jul. 22, 1982, Ser. No. 400,848

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.[4] **C07D** *213/65;* **A61K** *31/44*

U.S. Cl. 514—345 **12 Claims**

1. A compound of structural formula (I):

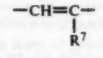


(I)

or a pharmaceutically acceptable salt thereof wherein

m is 0 or 1;

A is

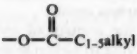


where R^7 is hydrogen, chloro or fluoro;

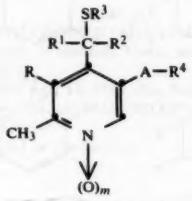
R^1 and R^2 are independently hydrogen or C_{1-3}alkyl;

R^3 is

where E represents
(1) adamantyl or C_{3-9}cycloalkyl;
(2) C_{1-3}alkoxy; or
(3) C_{1-6}alkyl;
R^4 is
(a) hydrogen; or
(b) C_{1-3}alkyl;
R is
(a) hydroxy;
(b) hydroxy-C_{1-3}alkyl (C_{1-3}alkoxy); or
(c)



9. A method of treating inflammation which comprises the administration to a warm-blooded animal or human in need of such treatment an effective amount of a compound having the structural formula (I):

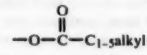


(I)

or a pharmaceutically acceptable salt thereof wherein
m is 0 or 1;
A is

where R^7 is hydrogen, chloro or fluoro;
R^1 and R^2 are independently hydrogen or C_{1-3}alkyl;
R^3 is

where E represents
(1) adamantyl or C_{3-9}cycloalkyl;
(2) C_{1-3}alkoxy; or
(3) C_{1-6}alkyl;
R^4 is
(a) hydrogen; or
(b) C_{1-3}alkyl;
R is
(a) hydroxy;
(b) hydroxy-C_{1-3}alkyl (C_{1-3}alkoxy); or
(c)



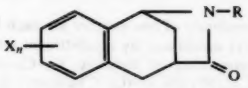
4,546,107

1,4-METHANO-2-BENZAZEPINE DERIVATIVES USEFUL AS CEREBAL DYSFUNCTION-IMPROVING DRUGS, ANTI-CONVULSANT, ANTI-EPILEPTIC OR ANTI-ANXIETY DRUGS

Tetsuya Tahara, Nakatsu; Masafumi Arita, Tokyo, and Tsuyoshi Kuroda, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP83/00286, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/00961, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 30, 1983, Ser. No. 609,866
Claims priority, application Japan, Sep. 7, 1982, 57-155584; Sep. 7, 1982, 57-155585
Int. Cl.⁴ A61K *31/40*; C07D *207/56*
U.S. Cl. 514—411 **10 Claims**

1. 1,4-Methano-2,3,4,5-tetrahydro-1H-2-benzazepin-3-one compounds represented by the formula:



wherein X is halogen, n is 1 or 2, and R is hydrogen, lower alkyl or phenyl-lower alkyl.

10. A cerebal dysfunction-improving, anti-convulsant, anti-epileptic or anti-anxiety composition comprising a effective amount of said compound of claim 1 and a pharmaceutically acceptable carrier.

4,546,108

PESTICIDAL COMPOSITION AND USE

Ivan P. Rout, Bishops Stortford, and Christopher Gillings, Linton, both of England, assignors to FBC Limited, Cambridge, England

Filed Jan. 6, 1981, Ser. No. 222,879
Claims priority, application United Kingdom, Jan. 18, 1980, 8001748
Int. Cl.⁴ A01N *43/16*
U.S. Cl. 514—464 **16 Claims**

1. A stable, pesticidal, liquid suspension of low volatility comprising 100–300 g of bendiocarb per liter of suspension, said bendiocarb having a particle size of less than 20 microns in largest dimension and being suspended in 300–996 ml per liter of suspension of a chemically inert oil, said oil having a solubility for bendiocarb below 0.05 g/liter of oil at 20° C., a flash point between 100° and 300° C., a kinematic viscosity between 0 and 100 centistokes at 40° C., a boiling point of 200° to 400° C., said suspension also comprising 1–200 g/liter of a surface active agent.

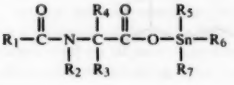
4,546,109

ORGANOTIN COMPOUNDS AND PESTICIDAL COMPOSITIONS

Adolf Hubele, Magden, and Peter Riebli, Buckten, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 13, 1983, Ser. No. 504,021
Claims priority, application Switzerland, Jun. 22, 1982, 3820/82
Int. Cl.⁴ C07F *7/22*; A01N *55/04*; A61K *31/32*
U.S. Cl. 514—493 **15 Claims**

1. A compound of the formula



wherein

R_1 is lower alkyl or lower alkyl substituted by a substituent selected from the group consisting of hydroxy, C_1–C_6-alkoxy, C_3–C_4-alkenyloxy, C_1–C_3-alkoxy-(C_1–C_3-alkoxy), C_1–C_6-alkylthio, C_1–C_4-alkylsulfonyloxy, C_1–C_4-alkylaminosulfonyloxy, C_1–C_4-alkylsulfonyl, C_1–C_4-alkylsulfoxy, halogen, phenyl, phenoxy, benzyloxy and azolyl; lower alkenyl halogen-substituted alkenyl; cycloalkyl or halogen-substituted cycloalkyl;

R_2 is aryl or aryl substituted by a substituent selected from the group consisting of halogen, C_1–C_3-alkoxy, C_1–C_3-alkyl and C_1–C_3-haloalkyl;

R_3 and R_4 independently of one another are each hydrogen; or lower alkyl or lower alkyl substituted by a substituent selected from the group consisting of hydroxy, C_1–C_6-alkoxy, C_3–C_4-alkenyloxy, C_1–C_3-alkoxy-(C_1–C_3-alkoxy), C_1–C_6-alkylthio, C_1–C_4-alkylsulfonyloxy, C_1–C_4-alkylaminosulfonyloxy, C_1–C_4-alkylsulfonyl, C_1–C_4-alkylsulfoxy, halogen, phenyl, phenoxy, benzyloxy and azolyl; and

R_5, R_6 and R_7 independently of one another are each lower alkyl or lower alkyl substituted by a substituent selected from the group consisting of hydroxy, C_1–C_6-alkoxy, C_3–C_4-alkenyloxy, C_1–C_3-alkoxy-(C_1–C_3-alkoxy), C_1–C_6-alkylthio, C_1–C_4-alkylsulfonyloxy, C_1–C_4-alkylaminosulfonyloxy, C_1–C_4-alkylsulfonyl, C_1–C_4-alkylsulfoxy, halogen, phenyl, phenoxy, benzyloxy and azolyl; cycloalkyl or halogen-substituted cycloalkyl; or aryl or aryl substituted by a substituent selected from the group consisting of halogen, C_1–C_3-alkoxy, C_1–C_3-alkyl and C_1–C_3-haloalkyl.

7. A pesticidal composition for controlling and/or preventing an infestation of plants by phytopathogenic fungi, bacteria or insects, which composition comprises, as at least one active ingredient, a compound according to claim **1** and a carrier.

4,546,110

PHEROMONES

Glenn W. Dawson, Houghton Regis; David C. Griffiths, Harpenden, and John A. Pickett, Kimpton, all of England, assignors to National Research Development Corporation, England

PCT No. PCT/GB82/00156, § 371 Date Jan. 20, 1983, § 102(e) Date Jan. 20, 1983, PCT Pub. No. WO82/04249, PCT Pub. Date Dec. 9, 1982

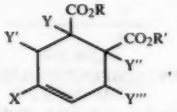
PCT Filed May 28, 1982, Ser. No. 463,875

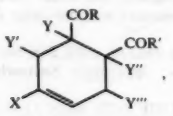
Claims priority, application United Kingdom, May 28, 1981, 8116357

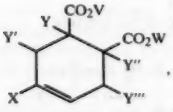
Int. Cl.[4] **C07C** *61/35, 69/75, 175/00;* **A01N** *49/00*

U.S. Cl. 514—529 **53 Claims**

1. A compound of the formula







or

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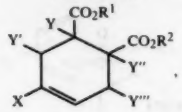
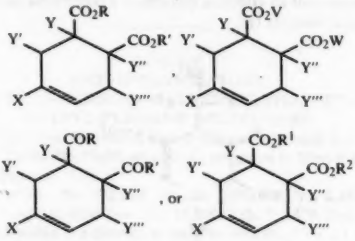


wherein X is 4,8-dimethyl-3,7-nonadienyl, Y, Y', Y'' and Y''' are each hydrogen or any two of these which are adjacent form the second double bond of a carbon-carbon double bond joining the positions to which they are attached and the other two are hydrogen; R and R' are the same or different and each is unbranched or branched alkyl or alkenyl of up to 18 carbon atoms; V is $-(CH_2CH_2O)_{n'}H$ wherein n' is 1 to 10; W is the same or different $-(CH_2CH_2O)_{n'}H$ wherein n' is as above defined, or is unbranched or branched alkyl or alkenyl of up to 18 carbon atoms; and R^1 and R^2 are each hydrogen or one is hydrogen and the other is unbranched or branched alkyl or alkenyl of up to 18 carbon atoms.

35. A method for the control of crop damage by aphids which comprises applying to a crop in need of protection from such damage an effective amount of a compound of the formula



wherein X is 4,8-dimethyl-3,7-nonadienyl, Y, Y', Y'' and Y''' are each hydrogen or any two of these which are adjacent form the second double bond of a carbon-carbon double bond joining the positions to which they are attached and the other two are hydrogen; R and R' are the same or different and each is unbranched or branched alkyl or alkenyl of up to 18 carbon atoms; V is $-(CH_2CH_2O)_{n'}H$ wherein n' is 1 to 10; W is the same or different $-(CH_2CH_2O)_{n'}H$ wheren n' is as above defined, or is unbranched or branched alkyl or alkenyl of up to 18 carbon atoms; and R^1 and R^2 are each hydrogen or one is hydrogen and the other is unbranched or branched alkyl or alkenyl of up to 18 carbon atoms.

4,546,111

PROCESS FOR THE PRODUCTION OF OXYGENATED ORGANIC COMPOUNDS SUCH AS METHANOL

David L. Banquy, Paris, France, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Apr. 22, 1983, Ser. No. 487,655

Int. Cl.[4] **C07C** *27/06*

U.S. Cl. 518—703 **24 Claims**

1. A process for the production of an oxygenated organic product from a feedstock containing carbon, comprising the steps of:

(a) gasifying said feedstock by reacting said feedstock adiabatically with an oxygen-rich gas stream, at a temperature between 800° C. and 1250° C. to produce a raw synthesis gas having a methane content between 1 and 10 mole percent on a dry basis;

(b) mixing said raw synthesis gas stream with a hydrogen-rich gas stream to form a final synthesis gas stream;

(c) injecting said final synthesis gas into a synthesis loop, forming said oxygenated organic product in said loop, and extracting from said loop a purge gas stream in an amount

to maintain between about 5 and about 35 mole percent methane circulating in the synthesis loop;

(d) separating said purge gas stream cryogenically to form a hydrogen-rich gas stream, an argon-rich gas stream, and a methane-rich gas stream; and

(e) recycling said hydrogen-rich gas stream to step (b).

4,546,112

METHOD FOR PREVENTING OR REDUCING DIPILATORY IRRITATION

Thomas R. LaHann, Cleves, and Ralph W. Farmer, Maderia, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 330,731, Dec. 14, 1981, abandoned. This application Dec. 2, 1983, Ser. No. 557,677

Int. Cl.⁴ A61K *31/165, 7/155*

U.S. Cl. 514—627 **9 Claims**

1. A method for preventing or reducing the dermal irritation caused by a thioglycolate depilatory agent, which comprises the step of applying to at least a portion of the depilated area an anti-irritant selected from the group consisting of capsaicin, its dermatologically acceptable salt(s), or mixtures of capsaicin and its salt(s) in an amount effective to prevent or reduce the irritation caused by treatment of the depilated area with a thioglycolate depilatory agent.

4,546,113

ANTIPROTOZOAL DIAMIDINES

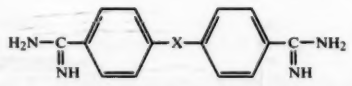
Edward A. Glazer, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,803

Int. Cl.⁴ A61K *31/155;* **C07C** *123/00*

U.S. Cl. 514—636 **5 Claims**

1. A compound of the formula



wherein X is $-CH_2CH{=}CH-$ or $-CH_2C(CH_3){=}CH-$.

5. A method of treating a susceptible protozoal infection in a mammal which comprises parenteral administration of an antiprotozoal effective amount of compound of claim 1 in a pharmaceutically acceptable liquid vehicle.

4,546,114

PROCESS FOR THE PREPARATION OF POLYUREA ELASTOMERS

Louis M. Alberino, Cheshire; Dale F. Regelman, Wallingford, and Nancy P. Vespoli, Guilford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 25, 1984, Ser. No. 664,820

Int. Cl.⁴ C08G *18/14*

U.S. Cl. 521—51 **18 Claims**

1. In a process for the preparation of a high flexural modulus elastomer containing polyurea linkages by the reaction injection molding of (i) an organic polyisocyanate, (ii) an organic compound having at least two active hydrogen containing groups and a molecular weight of from about 1500 to about 12,000, and (iii) an aromatic diamine extender wherein at least one of the positions ortho to each amine group of said diamine is substituted by a lower alkyl group, the improvement which comprises injecting the above ingredients into a mold said mold being at a temperature of from about 110° to about 190° and holding thereat for a time sufficient to achieve an improvement in the brittle properties on demold of said molded elastomer.

4,546,115

POLYIMIDE COMPOSITIONS AND FOAMS AND METHODS OF MAKING SAME

John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92021

Filed Feb. 25, 1985, Ser. No. 705,129

Int. Cl.⁴ C08J *9/02*

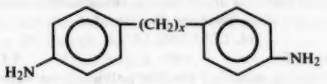
U.S. Cl. 521—77 **10 Claims**

1. In the method of making a polyimide precursor composition suitable for use in the manufacture of non-friable polyimide foams, which comprises the steps of esterifying an aromatic dianhydride with an esterifying solvent of produce a half-ester and reacting said half-ester with a diamine to produce a polyimide precursor composition;

the improvement wherein:

said diamine consists of a mixture of at least one aromatic-aliphatic diamine and from 0.1 to 50 mole % of at least one aliphatic diamine;

said aromatic-aliphatic diamine having the general formula:



wherein

x is a positive integer from 1 to 20; and

said aliphatic diamine has the general formula:

$$H_2N{=}(CH_2)_y{=}NH_2$$

wherein y is a positive integer from 2 to 12.

4,546,116

PROCESS FOR THE PRODUCTION OF HIGHLY ELASTIC FOAMS CONTAINING URETHANE GROUPS AND FOAMS OBTAINABLE BY THIS PROCESS

Hanns P. Müller, Odenthal; Hans Hettel, Cologne; Kuno Wagner, and Peter Vogtel, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 652,930

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336029

Int. Cl.⁴ C08G *18/14, 18/32*

U.S. Cl. 521—106 **20 Claims**

1. A process for the production of a foam containing urethane groups by reacting a polyether containing at least two hydroxyl groups and having a molecular weight of 400 to about 10,000 with a polyisocyanate comprising a member selected from the group consisting of toluene diisocyanates, phosgenation products of aniline-formaldehyde condensates and mixtures thereof in the presence of water and

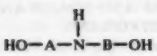
(a) about 0.01 to 0.2 parts, based on 100 parts of said polyether, of an organic or inorganic compound which shows an alkaline reaction in aqueous medium and in which the group $(R—O)^{\ominus}Me^{\oplus}$ is present at least once, wherein

$Me^{\oplus}$ is an alkali metal, optionally in complexed form, or a quaternary ammonium group and

R represents hydrogen, alkyl, cycloalkyl, aryl, or aralkyl groups, which may also contain hetero atoms, and also the groups R′—CO—, R′—CS—, R′—CO—O—, R′—O— and R′—CO—NH, where R′ is one of the organic radicals mentioned in the definition of R,

(b) a compound containing a labile halogen atom and,

(c) about 0.05 to 10 parts, based on 100 parts of said polyether, of a crosslinking agent corresponding to the formula



wherein A and B may be the same or different and represent C_2–C_8-alkylene or C_5–C_8-cycloalkylene radicals.

4,546,117

COMBUSTION MODIFIED FLEXIBLE POLYURETHANE FOAM

John F. Szabat, Pittsburgh, Pa., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Apr. 22, 1983, Ser. No. 487,652

The portion of the term of this patent subsequent to Apr. 26, 2000, has been disclaimed.

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—107 **8 Claims**

1. A combustion modified flexible polyurethane foam produced by reacting:

(A) an organic polyisocyanate,

(B) a polyether polyol selected from the group consisting of

(i) a polymer polyol prepared by polymerizing an ethylenically unsaturated monomer or monomers in a relatively high molecular weight organic compound containing at least two hydroxyl groups, and

(ii) mixtures of said polymer polyol and a polyoxyalkylene triol having an OH number of from about 25 to about 40,

(C) from about 80 to about 150 parts by weight of hydrated alumina of an average particle size of from about 1.5 to about 5 microns,

(D) from about 4 to about 12 parts by weight of antimony trioxide,

(E) from about 5 to about 30 parts by weight of decabromodiphenyl oxide,

(F) from about 15 to about 30 parts by weight of a halogenated phosphate ester,

(G) from 0 to about 5 parts by weight of a char former,

(H) from about 1.5 to about 3.5 parts by weight of water, and

(I) from 0 to about 20 parts by weight of an organic blowing agent,

said parts by weight of components (C) through (I) being based on 100 parts by weight of component (B), the ratio of components being such that the isocyanate index is from about 105 to about 115.

4,546,118

EPOXY FOAM

Scott S. Simpson, Woodstock; Anthony Yeznach, Norwich, and Carlos L. Barton, Brooklyn, all of Conn., assignors to Rogers Corporation, Rogers, Conn.

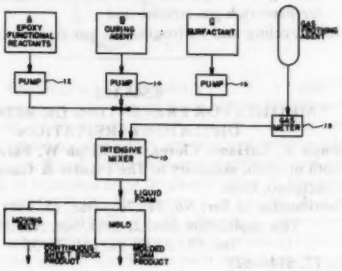
Filed Oct. 19, 1984, Ser. No. 662,589

Int. Cl.[4] C08J *9/30*

U.S. Cl. 521—130 **17 Claims**

1. A process for preparing an epoxy resin foam including the steps of:

mixing an epoxy resin stream with a curing agent stream in an intensive mixer;



adding a surfactant and a inert gaseous frothing agent to said mixture and mechanically frothing said mixture; and

curing said frothed mixture to form said epoxy resin foam.

4,546,119

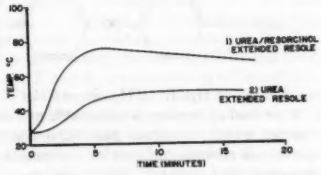
CLOSED CELL PHENOLIC FOAM

James Lunt, Brights Grove; Edwin J. MacPherson, and Paul J. Meunier, both of Sarnia, all of Canada, assignors to Fiberglas Canada, Inc., Ontario, Canada

Filed Nov. 29, 1984, Ser. No. 676,262

Int. Cl.[4] C08J *9/14*

U.S. Cl. 521—131 **13 Claims**



1. A method of making a phenolic foam material comprising the steps of

(1) preparing a base catalysed phenol-formaldehyde resole having a mole ratio of phenol to formaldehyde of between 1:3 and 1:4.5 and containing substantially no free phenol but including residual formaldehyde,

(2) neutralizing, concentrating and acidifying said resole;

(3) reacting with co-reactants consisting essentially of urea and resorcinol in an amount such that the molar ratio of combined urea and resorcinol to free formaldehyde in said resole is about 1:1, the ratio of urea to formaldehyde being selected so that in a test starting at ambient temperature a reaction temperature of 70°–75° C. is reached during foaming within a period of 4 to 8 minutes, the urea being reacted first where urea and resorcinol are separately reacted with the resole.

(4) combining the product of step 3 with (a) a surfactant in an amount sufficient to be effective as a cell stabilizer and

(b) a blowing agent in an amount sufficient to form a foam.

(5) initiating foam formation by adding to the mixture of step 4 a catalyst comprising an acidic material to reduce the pH of the mixture to below 4.

(6) curing the mixture of step 5.

4,546,120
URETHANE FORMING COMPOSITIONS BASED ON FATTY POLYOLS

Dwight E. Peerman, Minnetonka; Edward DiDomenico, Anoka, both of Minn.; Kurt C. Frisch, Grosse Ile, Mich., and Alfred Meffert, Monheim, Fed. Rep. of Germany, assignors to Henkel Corporation, Minneapolis, Minn.

Filed Mar. 26, 1985, Ser. No. 716,014
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—159 **20 Claims**

1. A composition useful in preparing polyurethanes comprising a mixture of an organic polyisocyanate and at least one fatty polyol of the formula:

$$R^1—((R^2—O)—CH—CH—(O—R^3))—R^4—O—R^5$$

wherein:

R^1 is a monovalent hydrocarbon radical having from 2 to 14 carbon atoms;

R^2 and R^3 are individually selected from the group of hydrogen, hydroxyl-substituted alkyl radicals, hydroxyl-substituted alkoxyalkyl radicals and hydroxyl-substituted poly(oxyalkylene) radicals, provided that each radical contains from 2 to 32 carbon atoms and from 1 to 9 hydroxyl substituents and, provided further, that at least one of R^2 and R^3 is other than hydrogen;

R^4 is a divalent hydrocarbon radical having from 4 to 14 carbon atoms provided that the sum of the carbon atoms in R^1 and R^4 must be from 10 to 24; and

R^5 is selected from the group of hydrogen, hydroxyl-substituted alkyl radicals, hydroxyl-substituted alkoxyalkyl radicals, hydroxyl-substituted poly(oxyalkylene) radicals, provided that each hydroxyl-substituted radical contains from 2 to 32 carbon atoms and from 1 to 9 hydroxyl substituents, and acyl radicals having the structural formula:

$$OC—R^6—((R^7—O)—CH—CH—(O—R^8))—R^9$$

wherein:

R^6 is a divalent hydrocarbon radical having from 3 to 13 carbon atoms;

R^7 and R^8 are individually selected from the group of hydrogen, hydroxyl-substituted alkyl radicals, hydroxyl-substituted alkoxyalkyl radicals and hydroxyl-substituted poly(oxyalkylene) radicals, provided that each radical contains from 2 to 32 carbon atoms and from 1 to 9 hydroxyl substituents and, provided further, that at least one of R^7 and R^8 is other than hydrogen; and

R^9 is a monovalent hydrocarbon radical having from 2 to 14 carbon atoms provided that the sum of the carbon atoms in R^6 and R^9 must be from 9 to 23.

4,546,121
USE OF POLYHYDROXYALKYL MONOUREAS FOR POLYURETHANE FOAMS, DISPERSIONS OF THE POLYHYDROXYALKYL MONOUREAS IN POLYOLS AND NEW TRIS-HYDROXYALKYL MONOUREAS

Peter Haas, Haan; Geza Avar, and Hartwig Grammes, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1984, Ser. No. 645,204
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332794
Int. Cl.[4] C08G *18/14*
U.S. Cl. 521—164 **15 Claims**

1. In a process for preparing a polyurethane foam by reacting an organic polyisocyanate with relatively high molecular weight compounds which contain isocyanate-reactive hydrogen atoms in the presence of a blowing agent, the improvement wherein a reactive flameproofing agent is included in the reaction mixture in an amount of from 3 to 100 parts per 100 parts of said relatively high molecular weight compound and wherein said flameproofing agent is a mono- to tetrahydroxyalkyl monourea of the following formula:

$$(HO—A\rightarrow_n—H_{2-n'}N—\overset{\overset{O}{\|}}{C}—NH_{2-n}—(A—OH)_n$$

in which

A represents straight-chain or branched C_2–C_6-alkylene groups which may contain one or more hydroxyl groups provided that the total number of hydroxyl groups in said flameproofing agent does not exceed four,

n=0, 1 or 2,

n′=1 or 2 and

n+n=1, 2, 3 or 4, with at least 50% by weight of said flameproofing agent coming within the above formula wherein the total number of hydroxyl groups is three wherein n=2 and wherein n′=1.

4,546,122
FLEXIBLE POLYURETHANE FOAMS

David A. Radovich, Imperial, Pa., and Michael K. Lowery, Moundsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 6, 1984, Ser. No. 638,325
Int. Cl.[4] C08G *18/14, 18/64, 18/32*
U.S. Cl. 521—164 **5 Claims**

1. A process for the production of a flexible polyurethane foam comprising reacting

(a) an organic polyisocyanate, and

(b) a coupled polyol which consists essentially of the reaction product of an organic polyisocyanate and an organic compound having an hydroxy functionality of at least 2 and a primary hydroxy group content of at least 30%, the ratio of hydroxyl groups in said organic compound to isocyanate groups being greater than 1,

(c) in the presence of

(i) a blowing agent,

(ii) a catalyst, and

(iii) a foam stabilizer, said foam stabilizer being capable of producing a flexible polyurethane foam meeting the standard specifications for high resilience polyurethane foam as set forth in ASTM D-3770-79, when used in a foam formulation based on toluene diisocyanate and either (A) a polymer polyol prepared by polymerizing one or more ethylenically unsaturated monomers in a polyether polyol, or (B) a dispersion of polyurea and/or polyhydrazodicarbonamide in an hydroxyl group containing material.

4,546,123
POLYMER HYDROGELS ADAPTED FOR USE AS SOFT CONTACT LENSES, AND METHOD OF PREPARING SAME

Doris Schäfer, and Rolf Schäfer, both of Arisdorf, Switzerland, assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 28, 1984, Ser. No. 687,277
Int. Cl.[4] C08K *9/12, 5/34, 5/05;* C08F *6/28*
U.S. Cl. 523—106 **21 Claims**

1. An improved polymeric hydrogel, comprising a polymeric hydrogel that has been modified by treating unmodified polymeric hydrogel containing polar functional groups with a surfactant selected from: carboxylated surfactants of formula (I): $R—O(CH_2—CH_2—O)_x—CH_2—COOH$ and formula (II): $R—NH(CH_2—CH_2—CH_2—NH)_x—CH_2—CH_2—CH_2—COOH$; nonionic surfactants of formula (III): $R—O(CH_2—CH_2—O)_x—CH_2—CH_2—OH$; polycationic surfactants of formula (IV): $R—NH(CH_2—CH_2—CH_2—NH)_x—CH_2—CH_2—CH_2—NH_2$; wherein R is a C_8 to C_{18} hydrocarbon chain and x is from 1 to 10 in the surfactants containing nitrogen and from 4 to 16 in the surfactants containing oxygen, said treatment being carried out in a modification regulating me-

dium selected from the group consisting of urea, organic solvents and saline solutions, said modification regulating medium containing a carbodiimide coupling agent.

4,546,124

POLYURETHANE BINDER COMPOSITIONS

Robert A. Laitar, Woodridge, and Eduardo Gomez, Chicago, both of Ill., assignors to Acme Resin Corporation, Forest Park, Ill.

Filed Oct. 12, 1984, Ser. No. 660,170
Int. Cl.[4] C08G *18/06*
U.S. Cl. 523—143 **27 Claims**

9. In a moldable composition comprising aggregate material, such as foundry sand, and a binder composition comprising a polyhydroxy component, an isocyanate component having a functionality of two or more, and sufficient catalyst to catalyze substantially completely the reaction between the polyhydroxy component and the isocyanate component wherein the improvement comprises using a polyhydroxy component consisting essentially of an alkoxy modified pheolic resole resin containing at least one alkoxy methylene group for every six phenolic nuclei wherein the preponderance of bridges joining the phenolic nuclei of said resin are ortho-ortho benzylic ether bridges.

4,546,125

ANAEROBIC CURING ADHESIVE COMPOSITIONS

Takanori Okamoto; Hisakazu Mori, and Hideaki Matsuda, all of Kagawa, Japan, assignors to Okura Kogyo Kabushiki Kaisha, Japan

Filed May 9, 1984, Ser. No. 608,519
Claims priority, application Japan, May 12, 1983, 58-81706
Int. Cl.[4] C09J *3/00*
U.S. Cl. 523—176 **6 Claims**

1. An anaerobic curing adhesive composition comprising 100 parts by weight of anaerobically polymerizable monomers containing at least 10% by weight of a hydrophilic anaerobically polymerizable monomer capable of dissolving more than 0.5% by weight of water and following components (a) to (d)

(a) o-benzoic sulfimide: 0.1 to 5 parts by weight

(b) a quinoline, a quinoxaline, phenazine or an aromatic tertiary amine: 0.1 to 5 parts by weight

(c) a radical polymerization initiator: 0.05 to 3 parts by weight

(d) water: 0.05 to 5 parts by weight

4,546,126

FLAME-RETARDING, REINFORCED MOULDING MATERIAL BASED ON THERMOPLASTIC POLYESTERS AND THE USE THEREOF

Franz Breitenfellner, Bensheim, and Thomas Kainmülle, Lindenfels/Odenwald, both of Fed. Rep. of Germany, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jul. 5, 1984, Ser. No. 627,992
Claims priority, application Switzerland, Jul. 13, 1983, 3842/83
Int. Cl.[4] C08K *94/04, 5/09, 67/02*
U.S. Cl. 523—216 **11 Claims**

1. A flame-retarding, reinforced polyester moulding material which contains

(a) a thermoplastic polyester which is a poly-1,4-butylene terephthalate or a copolyester based on polyethylene terephthalate and poly-1,4-butylene terephthalate,

(b) 3 to 50% by weight of a reinforcing filler,

(c) 5 to 30% by weight of a flame-retarding additive,

(d) 0.2 to 4.0% by weight of an unmodified phyllosilicate, or of a phyllosilicate modified with an organic ammonium salt, and

(e) 0.05 to 2.0% by weight of an alkali metal salt of an aliphatic monocarboxylic acid having 6 to 22 C atoms, the percentages by weight being based on the total weight of the moulding material.

6. A moulding material according to claim 1, which contains, as the component (d), a smectite.

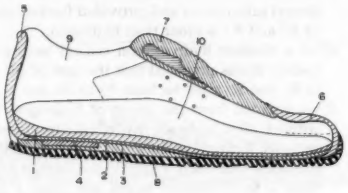
7. A moulding material according to claim 6, wherein the smectite is a bentonite or montmorillonite modified with an organic ammonium salt compound.

4,546,127

LOW-RESILIENCE RUBBER COMPOSITIONS AND FOAMS

Takatsugu Hashimoto, Higashimurayama, and Takashi Ohashi, Iruma, both of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 484,510, Apr. 13, 1983,. This application Aug. 13, 1984, Ser. No. 640,365
Claims priority, application Japan, Apr. 13, 1982, 57-60429; Nov. 25, 1982, 57-205551
Int. Cl.[4] C08J *9/32*
U.S. Cl. 523—219 **27 Claims**



1. A low-resilient, non-cellular, cured rubber composition soft at room temperature and having a hardness of 40° C. or less as measured by a type-A hardness tester as specified by the Japanese Industrial Standard 6301, a resilience of 30% or lower over a temperature range of from −10° C. to 50° C., and a tensile strength of 50 kg/cm^2 or higher, prepared by:

blending 100 parts by weight of a mixture of styrene-butadiene copolymers having a styrene content of from 53 to 75% by weight of the copolymer mixture and being prepared by mixing styrene-butadiene copolymers having styrene contents of 42 to 75% by weight of the styrene-butadiene copolymer, 30 to 300 parts by weight of a low-reinforcing or non-reinforcing filler and 5 to 100 parts by weight of a plasticizer;

adding effective amounts of a vulcanizing agent and a vulcanizing accelerator to said blend; and

heat curing said blend to produce said rubber composition.

4,546,128

COMPOSITE MATERIAL COMPOSITIONS USING WASTE SYNTHETIC FIBER

Yoshikazu Nakajima, Musashimurayama, Japan, assignor to Kabushiki Kaisha Mikuni Seisakusho, Musashimurayama, Japan

Filed May 9, 1984, Ser. No. 608,359
Claims priority, application Japan, May 13, 1983, 58-82767
Int. Cl.[4] C08F *29/10*
U.S. Cl. 523—222 **1 Claim**

1. A composite material suitable for injection molding comprising 100 parts by weight of waste polyester fiber in the form of separate filaments 0.5 to 10 mm. in length, intimately mixed and impregnated with 70 to 160 parts by weight of thermoplastic polypropylene resin.

4,546,129
ALLYLATED DI OR POLYCYCLOPENTADIENE DIPHENOLS AND THERMOSETTABLE COMPOSITIONS CONTAINING SAME

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 446,090, Dec. 2, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 621,766

Int. Cl.⁴ C08L *67/06, 77/12, 63/10*

U.S. Cl. 523—456 **18 Claims**

1. A composition which is thermosettable upon curing with a curing quantity of a suitable curing agent, which thermosettable composition comprises,

(1) from 5 to about 95 percent by weight (pbw) of at least one resin composition selected from the group consisting of

(a) unsaturated polyester resins,

(b) unsaturated polyesteramide resins,

(c) dicyclopentadiene modified unsaturated polyester resins,

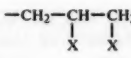
(d) dicyclopentadiene modified unsaturated polyesteramide resins, and

(e) vinyl ester resins,

(2) from zero to about 95 pbw of at least one polymerizable ethylenically unsaturated monomer; and

(3) from about 1 to about 50 pbw of a composition represented by Formulas I through XI;

wherein each A is independently $-CH_2-CH=CH_2$ or



wherein each X is a halogen and each n independently has a value of from zero to about 20.

4,546,130
MOLDING MATERIAL FOR THE STATOR OF A SUBMERSIBLE MOTOR

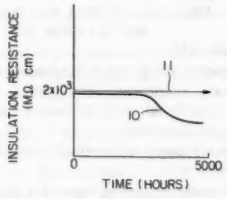
Mitsuhiro Nishida; Sakuei Yamamoto; Nobuo Sonoda, all of Fukuoka; Kazuo Okahashi, Toyonaka, and Shoji Takagi, Marugame, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1984, Ser. No. 640,838

Claims priority, application Japan, Sep. 6, 1983, 58-165383

Int. Cl.⁴ C08L *63/00*

U.S. Cl. 523—459 **2 Claims**



1. A molding material for the stator of a submersible motor, comprising:

approximately 20–30 parts by weight of an epoxy resin;

approximately 1–3 parts by weight of a curing agent;

approximately 0.5–1.5 parts by weight of zinc stearate;

approximately 2–3 parts by weight of a mechanical reinforcing agent;

approximately 7.5–56.5 parts by weight of quartz powder; and

one or more inorganic substances having moisture-absorption characteristics selected from anhydrous gypsum and silica gel, with the total amount of said inorganic substance(s) being approximately 55–20 parts by weight, and with the total amount of said quartz powder and inorganic substance(s) being approximately 62.5–76.5 parts by weight, and with the total weight of said molding material being 100 parts by weight.

4,546,131
POLYMER MODIFIED CYANATE MIXTURE AND EPOXY RESINS THEREOF

Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 15, 1985, Ser. No. 691,801

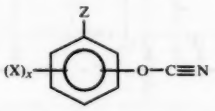
Int. Cl.⁴ C08G *59/26, 59/32/59/62, 73/06*

U.S. Cl. 523—466 **22 Claims**

1. A composition which comprises a mixture of

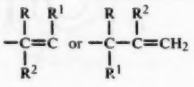
(A) from about 0.5 to about 95 percent by weight (%bw) of total composition of a product resulting from copolymerizing

(1) from about 0.1 to about 50, %bw of the combined weight of components (A-1) and (A-2) of at least one alkenylphenyl cyanate represented by the formula



(I)

wherein Z is a



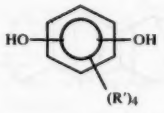
group;

each R, R^1 and R^2 is independently hydrogen or a hydrocarbyl group having from 1 to about 3 carbon atoms; each X is independently hydrogen, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 4 carbon atoms, chlorine, bromine or a phenyl group; and x has a value of 4; and

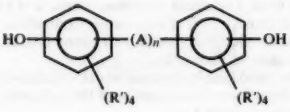
(2) from 50 to about 99.9 %bw of the combined weight of components (A-1) and (A-2) of at least one ethylenically unsaturated monomer; and

(B) from about 5 to about 99.5 %bw of total composition of a mixed cyanate of a polyphenol prepared by the reaction of at least 0.01 but not more than 0.95, mole of a cyanogen halide or mixture of cyanogen halides per mole of aromatic hydroxyl groups in the presence of a suitable base in a quantity of from about 0.01 to about 1.0, mole per mole of aromatic hydroxyl groups with an aromatic polyphenol represented by the formulas

(III)



(IV)



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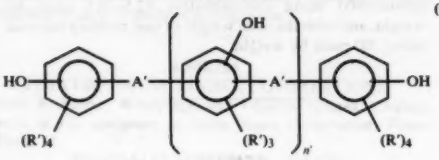
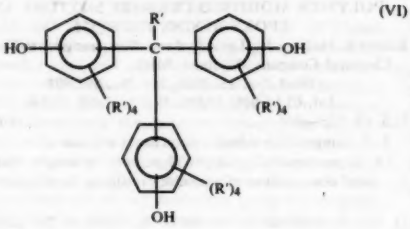
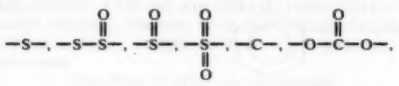
(V)

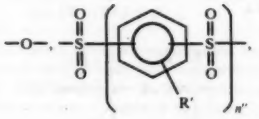


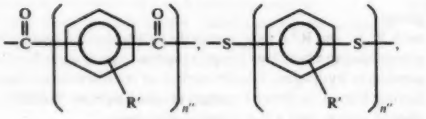
(VI)

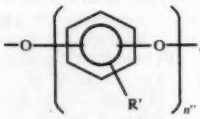


wherein each A is independently a divalent hydrocarbon group having from 1 to about 12, carbon atoms,









and the like;

each A' is a divalent hydrocarbyl group having from 1 to about 3, carbon atoms or a

group; each R' is independently hydrogen or a hydrocarbyl group having from 1 to about 6 carbon atoms or a halogen; n has a value of zero or 1; n' has a value from about 0.001 to about 6; n'' has a value from about 1 to about 100; and p has a value of from zero to about 10.

7. A polymer modified hydroxyaromatic triazine-containing oligomer resulting from trimerization of the polymer modified cyanate mixture of claim 1.

4,546,132

METHOD FOR MAKING CONCRETE WEATHER-RESISTANT

Aulis O. Miettunen, Parainen, Finland, assignor to Oy Partek Ab, Parainen, Finland

PCT No. PCT/FI81/00089, § 371 Date Jul. 28, 1982, § 102(e) Date Jul. 28, 1982, PCT Pub. No. WO82/02196, PCT Pub. Date Jul. 8, 1982

Continuation of Ser. No. 403,665, Jul. 28, 1982, abandoned. This PCT application Dec. 9, 1981, Ser. No. 654,539

Claims priority, application Finland, Dec. 22, 1980, 804005

Int. Cl.[4] C08K *3/00*

U.S. Cl. 524—8 **8 Claims**

1. A weather-resistant, high-strength concrete for structures subject to water that freezes to ice and melts again depending on ambient temperature, comprising: a concrete mix, including a cementing agent and rubber powder mixed in the concrete mix, the particle size of said rubber powder being between 80 and 250 μm and the amount thereof being 0.2–2% by weight of the cementing agent, whereby water absorbed into pores of the concrete may expand upon freezing into space occupied by the rubber powder particles and compress the same.

4,546,133

MOLDING COATING COMPOSITION AND PROCESS

Carroll W. Cope, Marion, Va., assignor to DG Shelter Products, Marion, Va.

Filed Dec. 30, 1983, Ser. No. 567,279

Int. Cl.[4] C09D *3/10, 3/12, 3/16*

U.S. Cl. 524—15 **2 Claims**

1. A composition for coating wood surfaces comprising at least one polymer selected from the group consisting essentially of a polysaccharide, polysaccharide ether. polysaccharide ester; and a polymer derived from at least one unsaturated monomer; at least one inorganic mineral; pecan shell flour; vegetable oil; alkyd resin; and a mixture of volatile organic solvents and esters.

4,546,134

COATED, HEAT SHRINKABLE EXPANDED POLYSTYRENE

Sherman Lakes, Lexington, Ky., assignor to Day Star Concepts, Lexington, Ky.

Filed Mar. 25, 1983, Ser. No. 479,018

Int. Cl.[4] C08K *5/52*

U.S. Cl. 524—141 **5 Claims**

1. An aqueous composition for coating an expanded polystyrene substrate comprising

a water soluble salt of a polymer of acrylic acid as a film forming component,

a plasticizing component effective to plasticize polystyrene;

a pigment;

an inorganic dispersing agent for dispersing the pigment; and

said film forming component present in an amount effective to bind said dispersing agent and said pigment to said substrate, said film forming component further being present in insufficient amounts to adversely affect the heat shrink characteristics of said expanded polystyrene substrate;

wherein the relative weight percentages of the combination of said film forming component, said plasticizing component and said dispersing component comprises:

from about 35% to about 55% film forming component, from about 15% to about 40% plasticizing component; and from about 20% to about 45% dispersing agent;

said percentages based on the combined actives which are

said film forming component, said plasticizing component and said dispersing agent.

4,546,135

SINTERABLE, FINELY DIVIDED MOLDED MATERIAL BASED ON POLYVINYL CHLORIDE

Manfred Engelmann, Burghausen; Otto Plewan, Neuötting; Helmut Kraus, Töging, and Heinz Klippert, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 563,669, Dec. 20, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 714,347

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247472

Int. Cl.[4] C08K 5/42

U.S. Cl. 524—158 **10 Claims**

1. A finely divided molding material, based on polyvinyl chloride which can be sintered to give flexible, porous moldings, has a K-value of 55 to 90, a bulk density of 400 to 70 g/liter, an average particle size of 10 to 50 μm and a particle size distribution of:

99 to 30% by weight	<33 μm
1 to 60% by weight	from 33 to 63 μm
0 to 9% by weight	from 63 to 125 μm and
0 to 1% by weight	>125 μm

and which consists essentially of:

(α) 99.8 to 97% by weight, relative to the molding material, of a vinyl chloride-alkyl acrylate copolymer which is a graft copolymer with poly(ethylene-vinylacetate) has been prepared by suspension polymerization of vinyl chloride monomer in the presence of at least one alkyl acrylate monomer, in the presence or absence of vinyl acetate monomer and in the presence of ethylene-vinylacetate copolymer, the latter having been dissolved in at least one said monomer or the monomer mixture, and the polymerization having been carried out in an aqueous phase, said vinyl chloride-alkyl acrylate copolymer has the following composition, in each case relative to the vinyl chloride-alkyl acrylate copolymer graft copolymerized with the ethylene-vinylacetate copolymer:

(a) 95 to 70% by weight of polymerized units of vinyl chloride,

(b) about 5 to 30% by weight of polymerized units of at least one alkyl acrylate having 3 to 10 carbon atoms in the alkyl group,

(c) 0.3 to 7% by weight of polymerized units of ethylene and

(d) 0.3 to 15% by weight of polymerized units of vinyl acetate, subject to the proviso that the amount of (d) is at least 3/7 of the amount of (c) and the total of the amounts of (b) plus (c) plus (d) is 5 to 30% by weight; and also

(β) 0.05 to 0.5% by weight, relative to the molding material, of at least one of the following free sulfonic acids: alkylsulfonic acids having 8 to 16 carbon atoms and alkylarylsulfonic acids having 3 to 16 carbon atoms in the alkyl chain;

(γ) 0.005 to 0.5% by weight, relative to the molding material of at least one water-soluble wetting agent containing 12 to about 50 carbon atoms and a quaternary nitrogen atom which forms a salt with a carboxylic or sulfonic acid group, and

(δ) a remainder, consisting essentially of suspending agents, residues of activators and other polymerization auxiliaries, subject to the proviso that the total of the amounts of α plus β plus γ plus δ is 100% by weight.

4,546,136

ORGANOTIN-CONTAINING COMPOSITION FOR THE STABILIZATION OF POLYMERS OF VINYL CHLORIDE

Boyd Cooray, Oldham, England, assignor to Akzo N.V., Arnhem, Netherlands

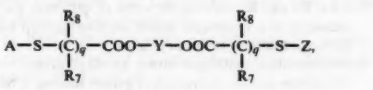
Filed May 17, 1984, Ser. No. 611,523

Claims priority, application Netherlands, May 18, 1984, 8301760

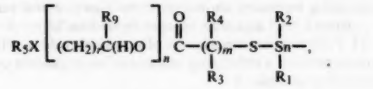
Int. Cl.[4] C08K 5/58; C07F 7/22

U.S. Cl. 524—180 **13 Claims**

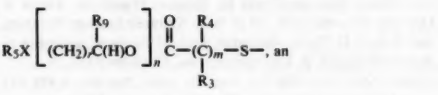
1. An organotin compound containing at least two tin atoms, characterized in that said compound corresponds to the formula

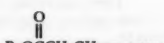


wherein A and Z represent tin-containing organic groups which may be the same or different and both correspond to the formula

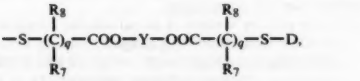


wherein R_1 and R_2 may be the same or different and may represent an alkyl group having 1 to 18 carbon atoms, the group



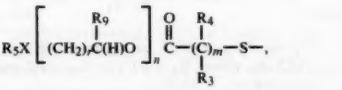


the group

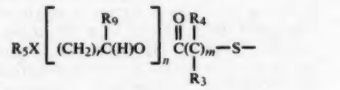


wherein

D corresponds to the same formula as A and Z, provided that in the case where, in the group A, R_1 and R_2 both represent an alkyl group or the group



R_1 in the group Z and/or D represents an alkyl group and R_2 represents the group



or R_1 and/or R_2 in the group Z and/or D represent the group

$$R_6OCCH_2CH_2-,$$

wherein R_6 represents an alkyl group having 1 to 18 carbon atoms which may be substituted or not with an alkoxy group having 1 to 18 carbon atoms, a polyoxyalkylene group consisting of oxyalkylene groups having 1 to 4 carbon atoms and of which the end group is an alkyl group or a hydrogen atom, a cycloalkyl group having 3 to 6 carbon atoms, an alkenyl group having 2 to 4 carbon atoms or a phenyl group;

R_3, R_4, R_7 and R_8 may be the same or different and have the meaning of a hydrogen atom, an alkyl group having 1 to 18 carbon atoms or an aryl group;

R_5 represents a hydrogen atom, an alkyl group having 1 to 18 carbon atoms, a cycloakyl group having 3 to 6 carbon atoms or a substituted or unsubstituted aryl group;

R_9 represents a hydrogen atom or a methyl group;

X represents an O or S atom;

Y represents a divalent substituted or unsubstituted aliphatic, cycloaliphatic or aromatic group having not more than 20 carbon atoms; and

m and q represent an integer from 1 to 6, n and r an integer from 1 to 3 and p an integer from 1 to 12.

11. Polymers or copolymers of vinyl chloride in which there is incorporated a stabilizing amount of an organotin compound according to claim **1**.

4,546,137

ADDITIVE COMBINATIONS AND FUELS CONTAINING THEM

Albert Rossi, Warren; David H. Rehrer, Westfield; Alexis A. Oswald, Mountainside, all of N.J.; Kenneth Lewtas, Wantage, and Robert D. Tack, Abingdon, both of England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 208,721, Nov. 20, 1980, Pat. No. 4,375,973. This application Dec. 20, 1982, Ser. No. 451,388

Claims priority, application United Kingdom, Nov. 23, 1979, 7940510

Int. Cl.[4] **C08K** *5/20*

U.S. Cl. 524—217 **12 Claims**

1. A fuel oil additive useful as a cold flow improver for distillate fuel oil comprising:

(A) one part by weight of an oil-soluble ethylene backbone distillate flow improving polymer having a number average molecular weight in the range of about 500 to 50,000 which is a copolymer consisting essentially of 3 to 4 molar proportions of ethylene per molar proportion of unsaturated ester of the general formula:

wherein R_1 is methyl or hydrogen, R_2 is $-OOCR_4$ or $-COOR_4$ where R_4 is a C_1 to C_{28} alkyl group and R_3 is hydrogen or $-COOR_4$;

(B) 0.1 to 10 parts by weight of an oil soluble hydrocarbon polymer having a number average molecular weight in the range of 10^3 to 10^6 selected from the group consisting of: copolymers comprising about 15 to 90 wt.% ethylene and 10 to 85 wt.% C_3 to C_{30} olefin; hydrogenated polymer consisting essentially of styrene or alkylated styrene with conjugated diene selected from the group consisting of butadiene, isoprene, piperylene and 2,3-dimethyl butadiene, or mixtures thereof; polymers consisting essentially of polyisobutylene; hydrogenated conjugated diene polymers consisting essentially of 1,3-butadiene, isoprene, 1,3-pentadiene, or 1,3-dimethyl butadiene, or mixtures thereof; and

(C) 0.1 to 10 parts by weight of polar oil soluble compound selected from the group consisting of:

(1) oil soluble nitrogen compounds containing a total of 30 to 300 carbon atoms and having at least one straight chain alkyl segment of 8 to 40 carbons and selected from the class consisting of amine salts and/or amides of hydrocarbyl carboxylic acids or anhydrides having 1 to 4 carbonyl groups; and

(2) compounds, other than (1) above, of the formula RX wherein R is an oil solubilizing hydrocarbon group of 8 to 150 carbon atoms and X is selected from the group consisting of carboxylate, sulfonate, sulphate, phosphate, phenate, and borate groups.

4,546,138

PROCESS FOR THE PRODUCTION OF POLYAMIDE IMIDES BY USING A PHENOL IN THE WORKUP OF THE MATERIAL

Wilfried Zecher, Leverkusen; Rolf Dhein, Krefeld, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,709

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332030

Int. Cl.[4] **C08G** *73/10*

U.S. Cl. 524—326 **3 Claims**

1. A process for the production of polyamide imides from polyisocyanates, polycarboxylic acid anhydrides and lactams or polyamides wherein the production of working up is carried out in the presence of from 0.2 to 15% by weight of a phenol which is mono- or poly-substituted with alkyl having from 1 to 20 carbon atoms, cycloalkyl having 6 to 12 carbon atoms or aryl having from 6 to 12 carbon atoms, with the proviso that when there is only alkyl substituents they must have in all at least 2 carbon atoms and wherein the polyamide imide is produced in a first stage in a solvent and is then in a second stage concentrated in an evaporation extruder at a temperature of from 240° to 400° C. and is then condensed out.

4,546,139

POLYBROMO DINAPHTHYL ETHERS

Paul G. Bay, Antioch; Nicodemus E. Boyer, Schaumburg, and Kenneth J. Sienkowski, Downers Grove, all of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 17, 1983, Ser. No. 505,508

Int. Cl.[4] **C08K** *5/06*

U.S. Cl. 524—367 **10 Claims**

1. A composition comprising (a) polymer, and (b) polybromo dinaphthyl ether containing at least four bromo groups.

4,546,140

ONE-PACKAGE AQUEOUS LATICES CONTAINING ALKALINE-CURABLE SELF-CROSSLINKING POLYMERS

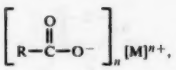
Yen-Jer Shih, Piscataway, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 2, 1984, Ser. No. 636,899

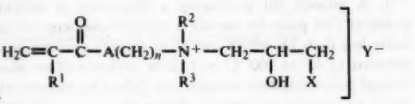
Int. Cl.[4] **C08K** *5/04, 5/09*

U.S. Cl. 524—394 **14 Claims**

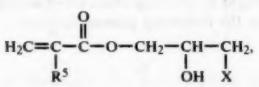
1. A shelf-stable, curable, one-package latex which consists essentially of a dispersion of an alkaline-curable, self-crosslinking emulsion polymer in water and a salt of an organic acid having the formula



where R is H or a C_1–C_6 straight or branched chain alkyl or C_2–C_6 alkenyl, M is an alkali, alkaline earth, or heavy metal, and n is the valence number of M; the self-crosslinking polymer comprising about 90–99.9% by weight of a vinyl polymerizable monomer selected from the group consisting of a vinyl ester of an up to C_6 saturated aliphatic monocarboxylic acid; an ester of acrylic or methacrylic acid with a C_1–C_{18} alcohol; an acrylamide, methacrylamide, or N-substituted derivative thereof; a vinyl ether; a N-vinyl lactam; a halogenated vinyl compound; an alkyl vinyl ketone; a diester of an α,β-unsaturated dicarboxylic acid; an allyl or methallyl ester of a saturated aliphatic monocarboxylic acid; a vinyl pyrrole, styrene, and an olefin; and about 0.1–10% by weight of a polymerizable cationic or non-ionic self-crosslinking monomer selected from the group consisting of a cationic quarternary ammonium monomer having the formula



and a nonionic monomer having the formula



where R^1 and R^5 are hydrogen or a methyl group; A is —O— or

with R^4 being hydrogen or a C_1–C_3 alkyl group; R^2 and R^3 are independently a C_1–C_6 alkyl group; X is a halogen; Y is an anion; and n is 1–4; the salt being present in an amount effective to cure the polymer, with or without the application of heat, after application of the dispersion and removal of the water therefrom.

4,546,141

PRIMER COATING COMPOSITION FOR TOPCOATS OF FLUOROCARBON POLYMERS CONTAINING A POLYARYLENE SULFIDE RESIN, AN AROMATIC POLYETHER-SULFONE RESIN OR AN AROMATIC POLYETHER-KETONE RESIN

Gerhard Gebauer, Burgkirchen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 19, 1983, Ser. No. 515,289

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227043; Jul. 20, 1982, 3227044; Jul. 20, 1982, 3227045

Int. Cl.[4] **C08K** *3/22;* **C08L** *29/10*

U.S. Cl. 524—401 **12 Claims**

1. A primer coating composition which comprises the following components, all amounts being based on the solids of said components:

(a) a component comprising 20–100% by weight of a copolymer containing

0.5 to 11% by weight, based on the weight of the copolymer, of copolymerized units of a perfluoro(alkylvinyl) ether of the formula CF_2=CF—OR, wherein R is a perfluoroalkyl radical having 1 to 10 carbon atoms,

0 to 12% by weight, based on the weight of the copolymer, of copolymerized units of hexafluoropropylene or vinylidene fluoride or mixtures of these two monomers,

essentially the remainder, to 100% of the weight of the copolymer, consisting essentially of copolymerized units of tetrafluoroethylene;

0 to 80% by weight of said component (a) comprising dispersed polytetrafluoroethylene particles having a mean particle size of 0.05 to 30 μm;

(b) 10 to 250 parts by weight, per 100 parts by weight of said component (a), of a mixture comprising lithium hydroxide and finely divided SiO_2 which has been produced by thermal treatment, the $LiOH:SiO_2$ molar ratio ranging from about 1:0.5 to about 1:30;

(c) 10 to 1000 parts by weight, per 100 parts by weight of said component (a), of a thermoplastic resin selected from the group consisting of:

(c_1) a polyarylene sulfide resin,

(c_2) an aromatic polyether-sulfone resin,

(c_3) an aromatic polyether ketone resin, and mixtures thereof; and

(d) water as a liquid carrier.

4. A primer coating composition as claimed in claim 1 wherein said dispersed polytetrafluoroethylene of component (a) is a polytetrafluoroethylene wax having a melt viscosity of 1 to 10^7 Pa s.

4,546,142

INHIBITING STYRENE EMISSIONS IN UNSATURATED POLYESTER RESINS

Leonard M. Walewski, Staten Island, N.Y., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1985, Ser. No. 689,697

Int. Cl.[4] **C08L** *91/08;* **C08K** *5/01*

U.S. Cl. 524—487 **2 Claims**

1. Unsaturated polyester composition comprising

(A) about 62 to about 67% by weight of a base resin consisting essentially of

about 100 to about 120 mole % diethylene glycol

about 55 to about 75 mole % maleic anhydride

about 25 to about 45 mole % phthalic anhydride

about 0.05 to about 0.25 weight % paraffin wax having a melting point of about 140° to about 145° F., and

(B) about 33 to about 38%, by weight, of styrene.

4,546,143

RUBBER VULCANISATES, HAVING A SHORE A HARDNESS OF BELOW 65°

Joachim Weil, and Richard Sattelmeyer, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1983, Ser. No. 480,093

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211917

Int. Cl.[4] **C08L** *21/00, 61/06;* **C08K** *3/04, 5/01*

U.S. Cl. 524—511 **13 Claims**

1. Rubber vulcanisates having a Shore A hardness below 65° and being based on compositions comprising a rubber component selected from the group consisting of natural rubber, butadiene-styrene rubber, butadiene-acrylonitrile rubber, polybutadiene, polyisoprene, mixtures thereof or mixtures of any of these rubbers with a minor amount of butyl rubber or ethylene-propylene-diene terpolymer rubber, at least 10% of plasticizing oils and at least 55% of active fillers containing active inorganic fillers and from 10 to 60% of phenolic resin systems—acting as reinforcing resins—which consists of novolaks and hardeners therefor, the weight ratio between the active inorganic fillers and the phenolic resin systems being in the range from (9:1) to (1:9), all percentages being referred to the weight of the rubber.

6. A vulcanisate as claimed in claim 1, wherein as a hardener 2 to 50% of a melamine resin or 2 to 30% of hexamethylene tetramine is used, referred to the weight of the novolak.

4,546,144

COATING COMPOSITIONS OF TETRAFLUOROETHYLENE AQUEOUS DISPERSIONS

Alan C. Knight, Parkersburg, W. Va., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1984, Ser. No. 569,571

Int. Cl.[4] C08L *27/12*

U.S. Cl. 524—546 **3 Claims**

1. An aqueous dispersion consisting essentially of

(a) water

(b) non-melt-fabricable tetrafluoroethylene polymer dispersed in the water, present in an amount of between 20 and 70% based on total dispersion weight,

(c) 4.0 to 9.0% based on weight of tetrafluoroethylene polymer, of a nonionic surfactant,

(d) 0.2 to 2.0 moles per kg of tetrafluoroethylene polymer, of at least one water-soluble salt in which the cation is selected from Al+++, Mg++ and Zn++ and the anion is a monovalent inorganic anion or an organic carboxylate anion or dianion; and

(e) sufficient inorganic acid or carboxyl-containing organic acid to cause the pH of the dispersion to be equal to 4 or less.

4,546,145

POLYMER COMPOSITION

Kazuo Kishida, Otake; Isao Sasaki, Hiroshima, and Nobuhiro Mukai, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 530,670, Sep. 9, 1983, abandoned, which is a division of Ser. No. 336,460, Dec. 31, 1981, Pat. No. 4,435,540. This application Aug. 14, 1984, Ser. No. 640,252

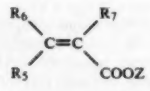
Claims priority, application Japan, Jan. 6, 1981, 56-937; Mar. 12, 1981, 56-35549

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

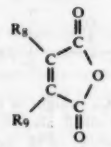
Int. Cl.[4] C08K *3/04, 3/08, 3/00, 3/26*

U.S. Cl. 524—780 **11 Claims**

1. A method of preparing a polymeric composition in which an inorganic substance is firmly consolidated in an organic polymer, comprising: heterogeneously polymerizing methyl methacrylate or a vinyl monomer mixture comprising methyl methacrylate as the major component without initiating the reaction with a radical polymerization initiator in a polymerization system containing said inorganic substance dispersed in an aqueous medium in the presence of at least one carboxylic acid monomer of the formula:



wherein R_5 is a hydrogen atom, an alkyl group of 1 to 15 carbon atoms, COOZ, halogen, phenyl or a derivative of a phenyl group, R_6 is hydrogen, alkyl of 1 to 15 carbon atoms, COOZ, hydrogen, phenyl or derivative of a phenyl group, R_7 is a hydrogen, alkyl of 1 to 15 carbon atoms, halogen, phenyl or derivative of a phenyl group, and Z is a hydrogen, ammonium or an alkali metal atom, or at least one monomer of the formula:



wherein R_8 and R_9 are each hydrogen, alkyl of 1 to 15 carbon atoms, halogen, phenyl or a derivative of a phenyl group.

4,546,146

PROCESS FOR PRODUCING DISPERSIONS COMPRISING FINE PARTICLES OF ACRYLONITRILE POLYMERS

Toshiyuki Kobashi, and Hideo Naka, both of Okayama, Japan, assignors to Japan Exlan Company, Ltd., Osaka, Japan

Filed Oct. 16, 1984, Ser. No. 661,332

Claims priority, application Japan, Oct. 21, 1983, 58-197745

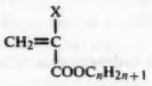
Int. Cl.[4] C08F *220/12, 220/44*

U.S. Cl. 524—831 **1 Claim**

1. A process for producing a dispersion of acrylonitrile polymer fine particles having a particle diameter of substantially less than 1μ which comprises copolymerizing, at a temperature of 40° to 100° C. and in the presence of an oil-soluble radical polymerization initiator, the following monomers (a) to (c) in an organic solvent which can dissolve acrylonitrile but cannot dissolve polyacrylonitrile:

(a) 70–98 weight % of acrylonitrile,

(b) 30–2 weight % of a long-chain alkyl(meth)acrylate represented by the following general formula:



wherein X represents H or CH_3 and n represents an integer from 12 to 22,

(c) 0–28 weight % of another ethylenic unsaturated compound.

4,546,147

COMPOSITIONS OF NYLON AND ELASTOMERS

James C. Woodbrey, Chesterfield, Mo.; Marlowe V. Moncur, Irvine, Calif., and Ross M. Hedrick, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 10, 1982, Ser. No. 440,772

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.[4] C08F *8/30*; C08L *63/00*

U.S. Cl. 525—183 **20 Claims**

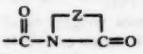
1. A composition comprising a blend of:

(a) from about 10 to about 97 percent by weight of the composition of a polyamide resin having a minimum molecular weight of about 5,000; and

(b) from about 3 to about 90 percent by weight of the composition of an elastomeric polymer which:

(1) is selected from the group consisting of polyethylene oxide, polypropylene oxide, polycaprolactone, polytetrahydrofuran, polybutadiene, polyisoprene, polyisobutylene, poly(C_1–C_8 alkylene acrylate), poly(C_1–C_4 dialkylene siloxane), poly(ethylene-co-propylene), poly(ethylene-co-carbon monoxide), polyethylene-co-vinyl chloride, and poly(ethylene-co-vinyl acetate) polymers and combinations thereof;

(2) contains a minimum of about 0.055 milliequivalents of acyllactam groups having the general formula



or acyclic derivatives thereof per gram of said elastomeric polymer, wherein Z is alkylene having from about 3 to about 14 carbon atoms.

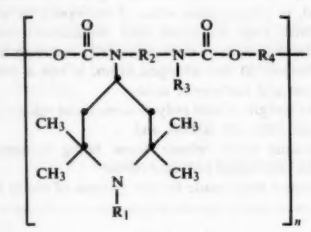
4,546,148

POLYMERIC COMPOUNDS, CONTAINING PIPERIDINE RADICALS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE AS STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Cantatore, Bitonto, Italy, assignor to Ciba-Geigy S.p.A., Origgio, Italy

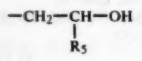
Filed Jul. 19, 1984, Ser. No. 633,423
Claims priority, application Italy, Jul. 19, 1983, 22138 A/83
Int. Cl.[4] C08L *75/00*
U.S. Cl. 525—186 **6 Claims**

1. A compound of the formula I

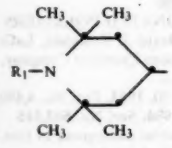


(I)

in which R_1 is hydrogen, O-, cyanomethyl, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or -alkynyl, C_7–C_{12}-aralkyl, C_1–C_{12}-acyl, 2,3-epoxypropyl or

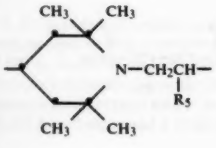


wherein R_5 is hydrogen, methyl, ethyl or phenyl, R_2 is C_2–C_{12}-alkylene, C_4–C_{18}-alkylene substituted by 1 to 2 oxygen or nitrogen atoms, C_6–C_{12}-cycloalkylene, C_6–C_{12}-Arylene or C_8–C_{12}-aralkylene, R_3 is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a radical of the formula (II)



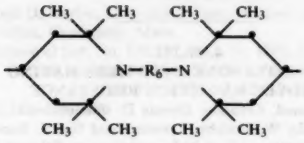
(II)

where R_1 is as defined above, R_4 is C_2–C_{18}-alkylene, C_4–C_{12}-alkylene substituted by 1 or 2 oxygen atoms, C_6–C_{18}-cycloalkylene, C_6–C_{18}-arylene, C_8–C_{18}-aralkylene or a radical of the formula (III) of (IV)



(III)

-continued



(IV)

wherein R_5 is as defined above and R_6 C_2–C_{12}-alkylene, C_4–C_{12}-alkenylene or C_8–C_{12}-aralkylene, and n is a number from 2 to 100.

4,546,149

VINYLIDENE FLUORIDE RESIN COMPOSITION CONTAINING GLYCIDYL (METH)ACRYLATE POLYMER

Kunizoh Kidoh, and Mitsuru Ohta, both of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 377,399, May 12, 1982, abandoned.
This application Apr. 30, 1984, Ser. No. 605,707
Claims priority, application Japan, May 18, 1981, 56-73415
Int. Cl.[4] C08L *27/16*
U.S. Cl. 525—199 **16 Claims**

1. A composition having improved resistance to decomposition and discoloration consisting essentially of 100 parts by weight of vinylidene fluoride polymer comprising at least 50 mole percent vinylidene fluoride, and 0.1 to 10 parts by weight of thermal stabilizer consisting of glycidyl acrylic polymer, said polymer being formed from monomers including at least one selected from the group consisting of glycidyl acrylate and glycidyl methacrylate.

4,546,150

FILM OF POLYMER MIXTURE CONTAINING 4-METHYL-1-PETENE POLYMER

Hiromi Shigemoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 634,115
Claims priority, application Japan, Jul. 26, 1983, 58-135226
Int. Cl.[4] C08L *23/20, 23/14*
U.S. Cl. 525—240 **12 Claims**

1. A film composed substantially of a polymer mixture containing a 4-methyl-1-pentene polymer, said polymer mixture comprising (A) the 4-methyl-1-pentene polymer and (B) a copolymer of propylene and an alpha-olefin, the propylene/alpha-olefin copolymer (B) containing 40 to 87 mole % of the propylene component and a heat of crystal fusion of not more than 80 joules/g, and the content of the propylene/alpha-olefin copolymer (B) being 5 to 70% by weight based on the total weight of the 4-methyl-1-pentene polymer (A) and the propylene/alpha-olefin copolymer (B).

4,546,151

OXYALKYLATED POLYAMIDOAMINES AND THEIR PREPARATION

Richard Baur; Knut Oppenländer, both of Dannstadt-Schauernheim; Rainer Strickler, Heidelberg, and Klaus Barthold, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,831
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1983, 3300866
Int. Cl.[4] C08G *69/48*
U.S. Cl. 525—430 **5 Claims**

1. An oxyalkylated polyamidoamine which is the reaction product of a polyamine containing from 3 to 5 amino or imino groups and from 4 to 20 carbon atoms with at least an approximately stoichiometric amount, based on the NH functions, of

caprolactam, oxyalkylated with from 10 to 30 moles, per equivalent of oxyalkylatable nitrogen valences, of alkylene oxide.

4,546,152

POLY(P-DIOXANONE) POLYMERS HAVING IMPROVED RADIATION RESISTANCE

Donald F. Koelmel, Lebanon; Dennis D. Jamiolkowski, Long Valley; Shalaby W. Shalaby, Lebanon, and Rao S. Bezwada, Whitehouse Station, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 7, 1984, Ser. No. 587,332
Int. Cl.[4] C08G *63/66*
U.S. Cl. 525—437 **19 Claims**

1. An absorbable, radiation sterilizable, normally solid polymer comprising a copolyester that comprises repeating divalent units of the formulas:

(A) —O—CO—CH_2—O—CH_2CH_2, and

(B) —G—, and

(C) —O—CO—CHR—O)$_m$Ph—O—CHR—CO—O—

wherein G represents the residue after removal of the hydroxyl groups of a dihydric alcohol, wherein Ph represents 1,2-, 1,3-, or 1,4- phenylene or alkyl- or alkoxy-substituted phenylene, wherein m represents a number having a value of 0 or 1, wherein each R individually represents hydrogen or lower alkyl, and wherein the divalent units (A), (B), and (C) are bonded to each other through ester groups contained in said units, wherein said polymer is produced by reacting p-dioxanone with a polyester comprising the repeating divalent units (B) and (C) as defined above.

4,546,153

METHOD FOR CURING POLYURETHANE COMPOUNDS

Yoshio Kamatani, Osaka, and Takurou Sakamoto, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 16, 1984, Ser. No. 672,190
Claims priority, application Japan, Nov. 25, 1983, 58-222826
Int. Cl.[4] C08G *18/38*
U.S. Cl. 525—453 **30 Claims**

1. A method for curing a polyurethane compound which comprises contacting a polyurethane compound having 1-oxa-3,5-diazine-2,4,6-trione ring but no isocyanate group with an amine present in gaseous phase in the presence or absence of a compound having active hydrogen.

4,546,154

PROCESS FOR FORMING MOLD RELEASABLE POLYURETHANE, POLYUREA AND POLYUREAURETHANE RESINS USING ISOCYANATE REACTIVE POLYSILOXANES AS INTERNAL MOLD RELEASE AGENTS

John R. Robertson, Glenn Mills, Pa., assignor to ICI Americas Inc., Wilmington, Del.

Filed May 23, 1983, Ser. No. 497,036
Int. Cl.[4] B29F *1/00*; B29D *27/00*
U.S. Cl. 525—474 **18 Claims**

1. In a process for preparing resins by the reaction injection molding technique which comprises the impingement mixing of liquid organic polyisocyanates with isocyanate reactive ingredients selected from the group consisting of polyols, polyamines, polyolamines and catalysts the improvement which consists of dispersing therewith from 0.5–15 percent by weight based on the total reaction mix of a polysiloxane mold release agent which consists essentially of 0.5–20 mol percent of $R_aR'_bSiO_{[4-(a+b)]/2}$ units and from 80–99.5 mol percent of $R''_cSiO_{(4-c)/2}$ units where R is an isocyanate reactive organic radical, a has an average value of from 1–3, R′ and R″ are both non-isocyanate reactive organic radicals, b has an average value of 0–2, a+b is from 1–3, and c has an average value of from 1–3, wherein

the ratio of the total molecular weight to the total number of isocyanate reactive functional groups in the molecule ranges from 100–3500,

the combined formula weights of all isocyanate reactive organic radicals, R do not exceed 40% of the total molecular weight of said polysiloxane mold release agent,

the combined formula weights of all non-isocyanate reactive radicals, R′+R″ together do not exceed 40% of the total molecular weight of said polysiloxane mold release additive,

the combined formula weights of all the organic radicals R+R′+R″ in the molecule together do not exceed 60% of the total molecular weight of the molecule,

said polysiloxane mold release agent contains an average of at least two isocyanate reactive functional groups per molecule,

at least two of the isocyanate reactive functional groups in each molecule are located on separate organic radicals, R, attached independently to different silicon atoms in said polysiloxane,

said isocyanate reactive functional groups (R) are selected from the group consisting of alcohols, phenols, thiols, primary or secondary aromatic amines, which contain no oxygen, and not more than one nitrogen, atoms attached directly to, in conjugation with, or incorporated within, the aromatic ring nucleous, and secondary aliphatic amines wherein at least one of the alkyl carbon atoms, bonded directly to the nitrogen atom, is not a primary carbon atom and carboxylic acids,

the molecular weight of said polysiloxane mold release agent ranges from 1000 and 30,000, and

said polysiloxane mold release agent being substantially insoluble in said liquid polyisocyanate.

18. A fully cured resin made by the process of claim 1.

4,546,155

LATENT CURING AGENTS FOR EPOXY RESINS

Takeshi Hirose, Kawasaki; Nobuo Ito, Oisomachi; Kiyomiki Hirai, Kawasaki, and Koji Takeuchi, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 654,470
Claims priority, application Japan, Sep. 30, 1983, 58-182528
Int. Cl.[4] C08G *59/58*
U.S. Cl. 525—504 **11 Claims**

1. A latent curing agent for epoxy resin, characterised in that the latent curing agent is an adduct obtained by reacting (a) a polyfunctional epoxy compound, (b) a compound having at least one OH, NH_2, NH or SH group together with a tertiary amino group in the molecule, and (c) a carboxylic acid anhydride.

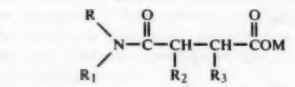
4,546,156

WATER-SOLUBLE SULFONATED POLYMERS

Dodd W. Fong, Naperville, and David J. Kowalski, LaGrange Park, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 509,549, Jun. 30, 1983, Pat. No. 4,490,308.
This application Aug. 23, 1984, Ser. No. 643,515
The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.
Int. Cl.[4] C08F *28/02*
U.S. Cl. 526—240 **12 Claims**

1. Water-soluble vinylic polymers derived from the free radical polymerization of an anionic monomer having the formula:



wherein:

M is hydrogen, lithium, sodium, potassium, ammonium, magnesium, or calcium, and mixtures thereof;
R is allyl;
R_1 is hydrogen or allyl;
R_2 is hydrogen or sulfonato;
R_3 is hydrogen or sulfonato; provided that R_2 is not the same as R_3.

4,546,157

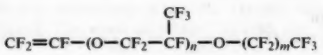
FLUORINE-CONTAINING COPOLYMER

Tsuneo Nakagawa, Ibaraki; Sadatsu Yamaguchi, Suita; Toshihiko Amano, Settsu, and Kohzoh Asano, Ibaraki, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Sep. 21, 1982, Ser. No. 420,614
Claims priority, application Japan, Sep. 21, 1981, 56-150418
Int. Cl.⁴ C08F *214/26*
U.S. Cl. 526—247 **6 Claims**

1. A fluorine-containing copolymer consisting essentially of monomeric units of

(a) from 95.8 to 80% by weight of tetrafluoroethylene,
(b) from 4 to 14% by weight of hexafluoropropene, and
(c) from 0.2 to 6% by weight of perfluorovinyl ether of the formula:



$$CF_2{=}CF{-}(O{-}CF_2{-}CF)_n{-}O{-}(CF_2)_mCF_3 \quad (I)$$

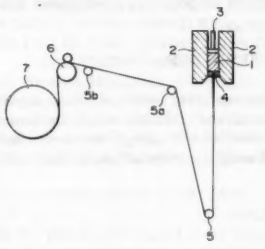
wherein n is an integer of 1 to 4, and m is an integer of 0 to 3.

4,546,158

VINYLIDENE FLUORIDE RESIN FIBER AND PROCESS FOR PRODUCING THE SAME

Toshiya Mizuno, and Naohiro Murayama, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1984, Ser. No. 633,433
Claims priority, application Japan, Jul. 23, 1983, 58-133590
Int. Cl.⁴ C08F *14/18;* D02G *3/00;* B32B *27/00*
U.S. Cl. 526—255 **6 Claims**



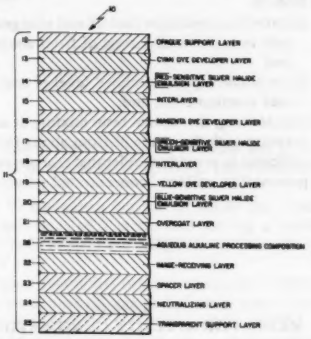
1. A vinylidene fluoride resin fiber, comprising a vinylidene fluoride resin having a number average polymerization degree of 600 or more, having no crystal melting point based on the vinylidene fluoride chains at a temperature below 178° C., and having a mean crystal length in the molecular chain direction of 200 Å or longer and a birefrigence of 30×10^{-3} or larger.

4,546,159

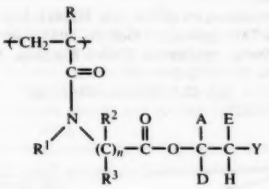
ELIMINATING POLYMERS USEFUL IN DIFFUSION CONTROL LAYERS

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 130,527, Mar. 14, 1980, Pat. No. 4,288,523.
This application Mar. 30, 1981, Ser. No. 248,680
Int. Cl.⁴ C08F *28/02, 22/30*
U.S. Cl. 526—286 **8 Claims**



1. A polymer comprising recurring units of the formula



wherein R is hydrogen or lower alkyl; R^1 is hydrogen or lower alkyl; R^2 and R^3 can each independently be hydrogen, lower alkyl, substituted lower alkyl, aryl, alkaryl, aralkyl, cycloalkyl, or R^2 and R^3 together with the carbon atom to which they are bonded can constitute a carbocyclic or heterocyclic ring, or R^3, when substituted on the methylene carbon atom next adjacent the nitrogen atom, can be taken together with R^1 to form part of a substituted or unsubstituted N-containing ring; A, D, and E are selected from the group consisting of hydrogen, methyl, and phenyl, provided that no more than one of the A, D or E may be methyl or phenyl; Y is a β-elimination activating group which in an alkaline environment activates a β-elimination reaction; and n is a positive integer one to six.

4,546,160

BULK POLYMERIZATION PROCESS FOR PREPARING HIGH SOLIDS AND UNIFORM COPOLYMERS

Julia A. Brand, and Lee W. Morgan, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 29, 1984, Ser. No. 584,661
Int. Cl.⁴ C08F *2/02*
U.S. Cl. 526—320 **13 Claims**

1. A continuous bulk polymerization process for preparing enhanced yields of high solids, non-styrenic acrylic polymer product having a number average molecular weight of about 1000 to 2500 a polydispersity ratio of less than about 3; a dispersion index of up to about 5 and a low chromophore content comprising the steps of continuously:

(a) charging into a continuous mixed reactor zone containing a molten resin mixture consisting esentially of;
(i) at least one acrylic monomer;

(ii) a polymerization initiator in amounts to provide a molar ratio of said initiator to said acrylic monomer from about 0.0005:1 to 0.06:1,

(iii) from about 0 to 25 percent based on the weight of acrylic monomers of a reaction solvent, wherein said molten resin mixture comprises unreacted acrylic monomers and the acrylic polymer product;

(b) maintaining a flow rate through said reaction zone sufficient to:

(i) provide a residence time of said charged acrylic monomer in said reaction zone of from about 1-30 minutes; and

(ii) maintain a predetermined level of reaction mixture in said reaction zone, and;

(c) maintaining the molten resin mixture at an elevated temperature with the range of from about 180° C. to 270° C. sufficient to provide accelerated conversation to a readily processable, uniform, concentrated polymer product.

4,546,161

MEDIA FOR AFFINITY CHROMATOGRAPHY

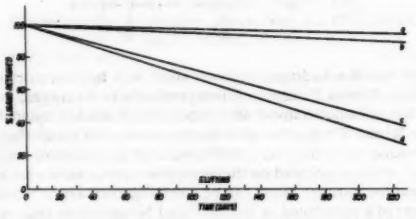
Michael J. Harvey, St. Albans, and Anthony Atkinson, Salisbury, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation-in-part of Ser. No. 165,481, Sep. 19, 1979, abandoned. This application Oct. 26, 1983, Ser. No. 545,546

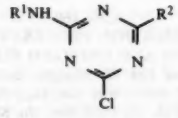
Claims priority, application United Kingdom, Jan. 24, 1978, 2878/78; Jan. 27, 1978, 3505/78

Int. Cl.[4] C08B *31/00, 37/02*

U.S. Cl. 527—312 **12 Claims**



1. A process for producing a protein-binding solid medium comprising reacting a protein-binding ligand material of structure



wherein R^1 is a sulphonated derivative of anthraquinone, a substituted anthraquinone, an aromatic azo group, or a phthalocyanine group, and R^2 is either an organic group or a chloro substituent, with an affinity chromatographic matrix containing hydroxy or amino groups which is a polymer or copolymer of agarose, dextrose, dextran or acrylamide at a pH of at least 8, in an aqueous solution of an alkali metal hydroxide and sodium chloride wherein the sodium chloride enhances the binding of the ligand material to the matrix by a common ion effect.

4,546,162

POLYAMIDOIMIDES PREPARED FROM TRIMELITIC ACID ANHYDRIDE, ISOCYANATES AND EITHER LACTAMS OR POLYAMIDES USING A MIXTURE OF DIISOCYANATODIPHENYLMETHANE AND TOLYLENE DIISOCYANATES

Wilfried Zecher; Willi Dünwald; Rudolf Merten, all of Leverkusen, and Klaus Reinking, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,706

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1983, 3332032

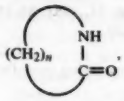
Int. Cl.[4] C08G *20/32*

U.S. Cl. 528—67 **9 Claims**

1. Polyamidoimides prepared by the reaction of

(i) trimellitic acid anhydride,

(ii) a lactam of the formula



wherein n is an integer of from 2 to 20, a polyamide of the formula

$$-[(CH_2)_n-CONH]-$$

wherein

n is an integer of from 2 to 20 or a polyamide of the formula

$$-[CO-(CH_2)_x-CONH-(CH_2)_y-NH]$$

wherein

x is an integer of from 0 to 18 and

y is an integer of from 2 to 18, and

(iii) isocyanates which are mixtures of from 98 to 40%, by weight, of 4,4'-diisocyanatodiphenylmethane and from 2 to 60%, by weight, of tolylene diisocyanates.

4,546,163

SILICON CARBIDE PRECERAMIC VINYL-CONTAINING POLYMERS

Loren A. Haluska, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 4, 1984, Ser. No. 647,329

Int. Cl.[4] C08G *77/06*

U.S. Cl. 528—14 **35 Claims**

1. A method of preparing a polysilane having the average formula

$$[R_2Si][RSi][R_d(CH_2{=}CH)Si]$$

wherein the remaining bonds on silicon are attached to other silicon atoms, and chlorine atoms or bromine atoms, said method consisting of treating a mixture consisting essentially of 80 to 99 weight percent of one or more disilanes of general formula

$$[R_bX_cSi]_2$$

and 1 to 20 weight percent of one or more silanes of general formula

$$R_d(CH_2{=}CH)SiX_{(3-d)}$$

with about 0.001 to 10 weight percent of a catalyst at a temperature of about 100° to 340° C. while distilling byproduced volatile materials until there is produced a chlorine-containing

or bromine-containing polysilane, which is a solid at 25° C., having the average formula

$$[R_2Si][RSi][R_d'(CH_2{=}CH)Si]$$

in which polysilane there is from 0 to 60 mole percent [R_2Si] units, 30 to 99.5 mole percent [RSi] units, 0.5 to 15 mole percent [$R_d'(CH_2{=}CH)Si$] units, where the remaining bonds on silicon in said polysilane are attached to other silicon atoms and chlorine atoms or bromine atoms; wherein said catalyst is selected from the group consisting of ammonium halides, tertiary organic amines, quaternary ammonium halides, quaternary phosphonium halides, hexamethylphosphoramide, and silver cyanide; wherein R is an alkyl radical containing from 1 to 4 carbon atoms; wherein b has a value of 0 to 2.5, c has a value of 0.5 to 3, and (b+c) equals three; wherein X is chlorine or bromine; wherein R' is an alkyl radical containing 1 to 4 carbon atoms, a vinyl radical, or a phenyl radical; wherein d is 1 or 2; and wherein said one or more silanes have a boiling point greater than 100° C. at 760 mm Hg.

4,546,164

PROCESS FOR PREPARING A ONE-COMPONENT ORGANOPOLYSILOXANE COMPOSITION

Ming Shen, Adrian, and Richard C. McAfee, Tecumseh, both of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Continuation of Ser. No. 635,464, Jul. 26, 1984, abandoned, which is a continuation of Ser. No. 445,302, Nov. 29, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 709,846

Int. Cl.⁴ C08G *77/06*

U.S. Cl. 528—15 **9 Claims**

1. A process for preparing a stable one-component composition which is capable of being cured to an elastomer at an elevated temperature which comprises (A) heating a mixture consisting essentially of a platinum catalyst which is capable of promoting the addition of silicon-bonded hydrogen to silicon-bonded aliphatically unsaturated groups and a filler to a temperature of at least 70° C. and thereafter (B) mixing an organopolysiloxane having a viscosity of at least 100 mPa.s at 25° C. and having an average of at least two silicon-bonded aliphatically unsaturated groups per molecule and an organosilicon compound having at least 2 silicon-bonded hydrogen atoms per molecule with the catalyst-filler mixture at a temperature below that at which crosslinking of the organopolysiloxane will occur.

4,546,165

PROCESS FOR THE PRODUCTION OF STABILIZED POLYISOCYANATES OF RETARDED REACTIVITY AND THEIR USE IN THE PRODUCTION OF POLYURETHANES

Gerhard Grögler; Heinrich Hess, both of Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 24, 1985, Ser. No. 694,566

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403500

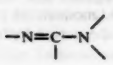
Int. Cl.⁴ C08G *18/08, 18/18, 18/72*

U.S. Cl. 528—53 **50 Claims**

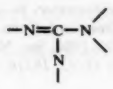
1. A process for the production of solid polyisocyanates stabilized by surface modification and exhibiting retarded reactivity comprising reacting:

(a) a solid, finely divided polyisocyanate having a melting point above 30° C.,

(b) from 0.1 to 25 equivalent percent of amidine/guanidine groups per isocyanate equivalent of an acyclic, monocyclic or bicyclic compound which contains one or more amidine groups of the formula



and/or one or more guanidine groups of the formula



provided that said compound does not contain any hydrogen atoms reactive with an isocyanate group at room temperature, and

(c) from 0 to 50 equivalent percent of amine per amidine/guanidine equivalent of a compound having a molecular weight of from 32 to 6000 and being selected from the group consisting of

(i) di- or higher functional organic compounds containing two or more aliphatically-bound primary and/or secondary amino groups,

(ii) organic compounds containing one or more terminal —CO—NH—NH_2 groups,

(iii) hydrazine and

(iv) mixtures thereof, said reaction being conducted at a temperature below the melting temperature of said polyisocyanate (a) and being conducted in the presence of

(d) a liquid medium selected from the group consisting of

(i) organic compounds containing one or more hydroxy groups and having molecular weights of from 62 to 6000,

(ii) organic compounds containing two or more aromatically-bound amino groups and having molecular weights of from 108 to 6000,

(iii) organic compounds containing two or more aliphatically-bound amino groups and having molecular weights of from 400 to 6000,

(iv) plasticizers,

(v) water,

(vi) mixtures thereof, and

(vii) mixtures of any one or more of (d)(i) through (d)(vi) with an apolar or slightly polar solvent,

to form a suspension of stabilized polyisocyanate in the liquid medium.

4,546,166

SEALANT COMPOSITION

Masahiro Niinomi, Machida; Yukihiro Okubo, Yokohama; Yoshinori Igarashi, Kawasaki, and Masashi Yoshinari, Yokohama, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1984, Ser. No. 663,115

Claims priority, application Japan, Oct. 22, 1983, 58-197925

Int. Cl.⁴ C08G *18/10*

U.S. Cl. 528—60 **5 Claims**

1. A quickly curing, non-foaming sealant composition comprising an isocyanate terminated prepolymer and a curing agent containing:

(a) a polyhydroxy compound having at least 2 terminal hydroxyl groups,

(b) a polyamine compound having at least 2 amine groups,

(c) a monoamine compound having a —NH_2 or a NH group and another functional group reactive with isocyanate groups, and

(d) a curing catalyst wherein the total active hydrogen of components (a), (b), and (c) is from 0.8 to 1.3 mol per 1 mol of free isocyanate groups of said isocyanate-terminated prepolymer; the total active hydrogen in amine groups of components (b) and (c) is 0.3 to 0.7 mol per 1

mol of free isocyanate groups of said isocyanate-terminated prepolymer; and the total active hydrogen in amine groups of said monoamine compound (c) is 0.3 to 2 mol per 1 mol of the active hydrogen in amine of said compound (b).

4,546,167

P-TMXDI POLYURETHANE ELASTOMERS WITH GOOD COMPRESSION SET PROPERTIES

Eugene Y. C. Chang, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jul. 30, 1984, Ser. No. 634,081
Int. Cl.[4] C08G *18/12, 18/16, 18/26, 18/18*
U.S. Cl. 528—64 **26 Claims**

1. A polyurethane elastomer composition, having a compression set less than or equal to about 40%, comprising the reaction product of:

(a) a polyurethane prepolymer having terminally reactive isocyanate groups and formed as a reaction product of polymeric diol with a stoichiometric excess of p-tetramethylxylene diisocyanate with

(b) a curatively effective amount of a curative selected from the group consisting of: diethyltoluenediamine, 2,4-bis(p-aminobenzyl)aniline, and mixtures thereof; and

(c) optionally, from about 0.01% to about 2% by weight of catalyst, based on the weight of curative.

4,546,168

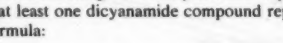
THERMOSETTING RESIN COMPOSITION COMPRISING (1) DICYANAMIDE, (2) POLYVALENT IMIDE AND (3) POLYMERIZABLE COMPOUND

Akio Takahashi, Hitachiota; Takeshi Shimazaki, Hitachi; Motoyo Wajima, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 435,766, Oct. 20, 1982, Pat. No. 4,482,703. This application Aug. 9, 1984, Ser. No. 639,092
Claims priority, application Japan, Oct. 23, 1981, 56-168787
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—107 **8 Claims**

1. A thermosetting resin composition comprising

(A) at least one dicyanamide compound represented by the formula:



NCHN—Y—NHCN (I)

wherein Y is a divalent organic group having an aromatic ring,

(B) at least one polyvalent imide having at least two maleimide rings, and

(C) at least one polymerizable compound selected from the group consisting of epoxy compounds, phenolic compounds and triallyl isocyanurate series compounds.

4,546,169

PROCESS FOR PREPARATION OF POLYESTER POLYOLS UTILIZING POLYALKYLENE TEREPHTHALATE

Larry L. Chandler, Greensboro; Thurston R. Friar, Jamestown, and Berwyn W. Green, Greensboro, all of N.C., assignors to Foam Systems Company, Riverside, Calif.

Filed Aug. 17, 1984, Ser. No. 642,136
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 **54 Claims**

1. A process for the preparation of a polyester polyol, comprising the steps of:

(a) reacting in a first reactor a polyhydric alcohol and a second reactant selected from the group consisting of a polycarboxylic acid, anhydride or an ester of a polycarboxylic acid at a first temperature with removal of a volatile by-product until a flowable intermediate ester has been produced;

(b) transferring the intermediate ester to a holding vessel in which it is held in a flowable condition;

(c) metering the intermediate ester to a second reactor;

(d) metering a recycled polyalkylene terephthalate feed to the second reactor; and

(e) reacting the intermediate ester with the polyalkylene terephthalate feed at a second temperature to form a finished polyester which is continuously removed from the second reactor.

4,546,170

POLYESTER RESINS USEFUL FOR FORMING CONTAINERS HAVING IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, and Burns Davis, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 26, 1984, Ser. No. 686,504
Int. Cl.[4] C08G *63/16*
U.S. Cl. 528—302 **20 Claims**

1. A polyester resin comprising the reaction product of

(A) a diol containing up to about 8 carbon atoms, and

(B) a diacid component comprising

(i) terephthalic acid and

(ii) oxydiacetic acid, wherein said oxydiacetic acid is present in an amount of about 5 to 50 mole percent, based upon the total amount of diacid, and wherein said polyester resin has an inherent viscosity of about 0.4 to 1.5.

4,546,171

METHOD FOR CONTINUOUS POLYCONDENSATION OF HIGHER ALIPHATIC ω-AMINO ACID PARTICLES

Eizo Gotah, Toyohashi; Takeshi Tomishima, Aichi; Tadao Tsutsumi, and Yoshiyuki Komuro, both of Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

PCT No. PCT/JP82/00450, § 371 Date Jul. 20, 1983, § 102(e) Date Jul. 20, 1983, PCT Pub. No. WO83/01954, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 25, 1982, Ser. No. 525,047
Claims priority, application Japan, Nov. 26, 1981, 56-189717
Int. Cl.[4] C08G *69/06*
U.S. Cl. 528—310 **3 Claims**

1. A method for continuous polycondensation of a higher aliphatic ω-amino acid which comprises:

enveloping particles of at least an ω-amino acid selected from the group consisting of 11-aminoundecanoic acid and 12-aminododecanoic acid in a gas which is inert with respect to said particles, placing the particles in a chamber which is essentially free of air,

reciprocally and repeatedly mechanically forcing a succession of said particles from said chamber to a melting container located downstream of said chamber, without entraining any liquid with said particles,

melting said particles in said melting container to obtain a melt of the ω-amino acid,

supplying the resulting melt to a tubular polycondensation reactor connected to receive the melt from the melting container, and

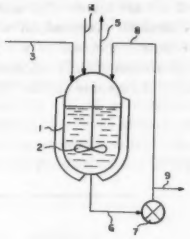
heating the melt to produce nylon 11, nylon 12 or a copolymer thereof.

4,546,172

PROCESS FOR PRODUCING POLYCARBONATE RESIN PARTICLES

Katsuhisa Kohyama; Akira Matsuno, and Kenji Tsuruhara, all of Kyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jan. 5, 1984, Ser. No. 568,422
Claims priority, application Japan, Jan. 20, 1983, 58-7971; Nov. 25, 1983, 58-221818
Int. Cl.[4] C08G *63/64*
U.S. Cl. 528—491 14 Claims



1. A process for producing polycarbonate resin particles from a methylene chloride solution of a polycarbonate resin obtained by the polycondensation of a dihydroxydiaryl compound and phosgene, which comprises:

continuously supplying said methylene chloride solution of polycarbonate resin into a particle-forming vessel further containing an agitated aqueous medium consisting of a suspension of polycarbonate resin particles;

heating the agitated mixture while maintaining the same in a suspended state to effect evaporation of methylene chloride, thereby resulting in the formation of polycarbonate resin particles;

subjecting at least a portion of the resulting aqueous slurry withdrawn from the particle-forming vessel which contains the polycarbonate resin particles, to a wet pulverization treatment; and

recycling at least a portion of the pulverized polycarbonate resin particles to the particle-forming vessel.

4,546,173

SELECTIVE CROSSLINKING OF LOW MOLECULAR WEIGHT SULFONATED LIGNINS AND LIGNOSULFATE PRODUCTS PRODUCED THEREBY

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 532,677, Sep. 16, 1983, abandoned. This application Oct. 30, 1984, Ser. No. 666,473
Int. Cl.[4] C07G *1/00*
U.S. Cl. 530—501 14 Claims

1. In an improved process for preparing sulfonated lignins particularly suited for use as dye dispersants and additives comprising the steps of preparing a sulfonated lignin and crosslinking the sulfonated lignin, the improvement comprising maintaining the pH of the crosslinking reaction between about 6.1 to 9 to selectively crosslink the sulfonated lignin fraction having molecular weights of 10,000 and below.

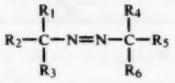
4,546,174

PROCESS FOR THE PREPARATION OF ALIPHATIC AZO COMPOUNDS USING AN AMINE COUPLING

Martyn W. Whitmore; Michael D. Pollard, and Stephen R. Smythe, all of Cambridge, England, assignors to FBC Limited, Cambridge, England

Continuation of Ser. No. 218,421, Dec. 19, 1980, abandoned. This application Feb. 8, 1984, Ser. No. 578,130
Claims priority, application United Kingdom, Dec. 20, 1979, 7943862
Int. Cl.[4] C07C *107/02*
U.S. Cl. 534—838 10 Claims

1. A process for the production of a compound of formula I,



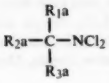
I

in which at least one of R_1, R_2 and R_3, and at least one of R_4, R_5 and R_6, represents an electron withdrawing group;

or one or both of R_1 and R_2, and R_4 and R_5, may together form a $—(CH_2)_n—$ chain, in which n is a whole number up to 5; the remainder of R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, each represent an electron withdrawing group, alkyl, cycloalkyl, phenyl or phenylalkyl;

the alkyl, cycloalkyl, phenyl or phenylalkyl group or the $—(CH_2)_n$ chain optionally being substituted by one or more hydroxy groups or acyl derivatives thereof, alkoxy groups, halogen atoms, or carboxylic acid groups or salts or esters thereof, in which at least one of R_1, R_2 and R_3, and at least one of R_4, R_5 and R_6 represents an electron withdrawing group,

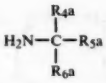
which comprises reacting one or more dichloramine compounds of formula II,



II

in which R_1a, R_2a and R_3a have the same significances as R_1, R_2, and R_3 above,

with one or more compounds of formula III,



III

in which R_4a, R_5a and R_6a have the same significances as R_4, R_5 and R_6 above,

the reaction being carried out in an aqueous medium in the presence of a base and a surfactant.

4,546,175

PROCESS FOR THE MANUFACTURE OF REELS OF NITROCELLULOSE THREAD

Hubert Delarche, Sigoules; Alain Brasquies, and Michel Maures, both of Bergerac, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Oct. 1, 1984, Ser. No. 656,668
Claims priority, application France, Jun. 5, 1984, 84 08752
Int. Cl.[4] C08B *5/02;* D06B *5/16*
U.S. Cl. 536—35 18 Claims

1. A process of manufacturing a reel of nitrocellulose threads, which comprises the steps of:

(1) Winding cellulose thread around a hollow core provided with orifices, two plates each located at each end of said

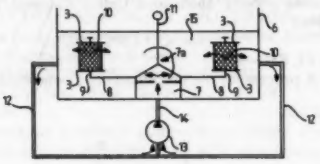
core, said plates having a central opening facing the hollow core and a plurality of sliding rods supported by said plates whereby a reel of cellulose is obtained;

(2) sliding said sliding rods to confer permeability to said reel of cellulose;

(3) drying said reel of cellulose;

(4) circulating a mixture of nitric acid and methylene chloride through said reel radially from said hollow core while said reel is immersed in said mixture of nitric acid and methylene chloride, whereby a reel of nitrocellulose thread is formed;

(5) immediately after nitration, stabilizing said reel of nitrocellulose by radially circulating water from said hollow core, the water having a temperature of 50°–90° C. at least at the end of the stabilization.



4,546,176

7-CARBOXYMETHOXYPHENYLACETAMIDO-3-CEPHEM DERIVATIVES AND ANTIBACTERIAL PREPARATIONS CONTAINING THE SAME

Yoshimasa Machida; Shigeto Negi; Seiichiro Nomoto; Takashi Kamiya; Kyosuke Kitoh, and Isao Saito, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

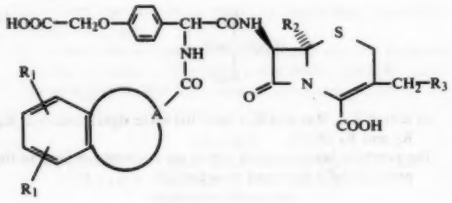
Filed Oct. 20, 1983, Ser. No. 544,406

Claims priority, application Japan, Dec. 14, 1982, 57-217726; Mar. 7, 1983, 58-36017

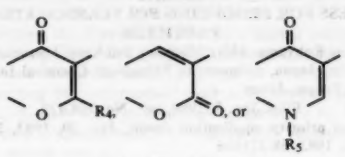
Int. Cl.⁴ C07D *501/00, 501/14;* **A61K** *31/54*

U.S. Cl. 544—21 **14 Claims**

1. A compound of the formula



wherein R_1 represents hydroxy, C_1–C_4 alkanoyloxy or C_1–C_4 alkoxycarbonyloxy, R_2 represents hydrogen or methoxy, R_3 repesents (1) C_1–C_4 alkanoyloxy or (2) pyridinium which is unsubstituted or substituted by C_1–C_4 alkyl, carboxyalkyl, sulfoalkyl, carboxyl, sulfo, amino, N,N-dialkylaminoalkyl, carbamoyl, alkylcarbamoyl, alkoxycarbonyl, cyano, hydroxycarbamoyl, N-hydroxycarbamoylalkyl, carbamoylalkyl, dialkylcarbamoyl, N-hydroxy-N-alkylcarbamoyl, hydroxy, hydroxyalkyl and alkoxycarbonylalkyl with the proviso that, when R_3 denotes the substituted or unsubstituted pyridinium, R_3 forms an intramolecular salt with the carboxy at the 4-position of the cephem nucleus, And A is a group of the formula:



in which R_4 and R_5 are individually hydrogen or C_1–C_4 alkyl, or a pharmaceutically acceptable salt thereof, wherein undefined alkyl and alk are lower alkyl and lower alk.

14. An antibacterial composition which comprises an antibacterially effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier therefor.

4,546,177

1-(6-HYDROXY-4- OR -7-METHOXY-5-BENZOFURANYL)-4-SUBSTITUTED-1,3-BUTANEDIONES

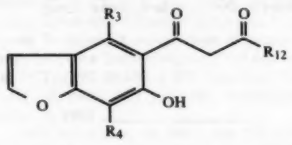
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 403,948, Jul. 30, 1982, Pat. No. 4,463,185, Continuation-in-part of Ser. No. 201,932, Oct. 29, 1980, Pat. No. 4,367,341, which is a division of Ser. No. 116,322, Jan. 28, 1980, Pat. No. 4,284,569, which is a continuation-in-part of Ser. No. 11,816, Feb. 13, 1979, abandoned. This application Apr. 24, 1984, Ser. No. 603,393

Int. Cl.⁴ C07D *307/86, 307/79*

U.S. Cl. 544—58.7 **1 Claim**

1. A compound of the formula



XXIII

wherein one of R_3 or R_4 is methoxy and the other is methoxy or hydrogen; wherein R_{12} is

(a) phenoxymethyl;

(b) phenylthiomethyl;

(c) phenoxymethyl or phenylthiomethyl substituted by chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms; or

(d) $—CH_2NR_8R_9$, wherein R_8 and R_9 are hydrogen, alkyl of one to 12 carbon atoms, inclusive, or aryl of 6 to 12 carbon atoms, inclusive, being the same or different, or wherein R_8 and R_9, taken together with N, form 3-piperidine methanol, 2-piperidine methanol, 3-piperidine ethanol, 2-piperidine ethanol, 1-piperazine propanol, 4-phenyl-1,2,3,6-tetrahydropyridine, 4-phenylpiperidine, proline, 3-pyrolidinol, tetrahydrofurfurylamine, 3-pyrroline, thiazolidine-4-carboxylic acid, thiomorpholine, morpholine 2-methylpiperidine, 3-methylpiperidine, 4-methylpiperidine, N-methylpiperazine, or 1-methylhomopiperazine, with the proviso that R_{12} is $—CH_2NR_8R_9$ only when R_4 is methoxy.

4,546,178
PROCESS FOR PREPARING VIRTUALLY ISOMER-FREE 4-AMINO-3-ETHYLTHIO-6-TERT.-BUTYL-1,2,4,-TRIAZIN-5-ONE

Thomas Schmidt, Haan, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 30, 1984, Ser. No. 666,576

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339858

Int. Cl.[4] **C07D** *253/06*

U.S. Cl. 544—182 **5 Claims**

1. In the preparation of amino-3-ethylthio-6-tert.-butyl-1,2,4-triazin-5-one (I) by reacting 4-amino-3-mercapto-6-tert.-butyl-1,2,4-triazin-5-one (II) with an ethylating agent in aqueous alkali solution, the improvement which comprises contacting the reaction mixture with at least 50 g of petroleum ether per mole of starting compound (II) at a temperature of about 40°–60° C. thereby forming two liquid phases, and cooling the mixture down to about room temperature, whereby substantially pure isomer-free end product of the formula (I) crystallizes out.

4,546,179
PROCESS FOR PREPARING SULFONYLUREAS

Robert A. Kunz, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 554,788, Nov. 23, 1983,. This application Sep. 6, 1984, Ser. No. 647,341

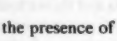
Int. Cl.[7] **C07D** *251/44, 251/46, 251/50, 251/52*

U.S. Cl. 544—206 **19 Claims**

1. A process for preparing a compound of the formula

comprising contacting at reaction conditions, a sulfonyl halide of the formula

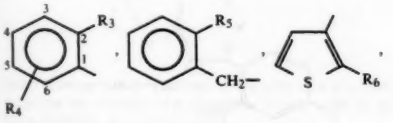
with an ammonium, phosphonium, sulfonium or an alkali metal cyanate salt of the formula

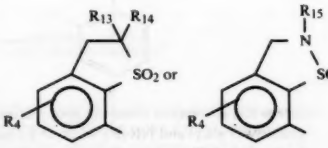


in the presence of an amine of the formula

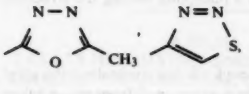
where

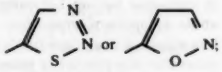
R is





R_3 is F, Cl, Br, C_1–C_4 alkyl, $SO_2NR_7R_8$, $S(O)_nR_9$, $SO_2NCH_3(OCH_3)$, CO_2R_{10}, OSO_2R_{11}, OR_{12}, NO_2,





R_4 is H, F, Cl, Br, CH_3, OCH_3, CF_3, NO_2 or CO_2R_{10} provided that when R_4 is CO_2R_{10} then it is in the 6-position;

R_5 is Cl, NO_2 or CO_2R_{11};

R_6 is Cl, Br, $SO_2NR_7R_8$, $S(O)_nR_{11}$ or CO_2R_{11};

R_7 and R_8 are independently C_1–C_3 alkyl;

R_9 is C_1–C_3 alkyl or C_1–C_3 alkyl substituted by 1–3 atoms of F or Cl;

R_{10} is C_1–C_4 alkyl, $CH_2CH_2OCH_3$, CH_2CH_2Cl or $CH_2CH{=}CH_2$;

R_{11} is C_1–C_3 alkyl;

R_{12} is C_1–C_4 alkyl, $CH_2CH{=}CH_2$, $CH_2C{\equiv}CH$ or C_1–C_3 alkyl substituted with 1–3 atoms of F or Cl;

R_{13} is H or CH_3;

R_{14} is H or CH_3;

R_{15} is C_1–C_4 alkyl;

n is 0 or 2;

X is Cl, F or Br;

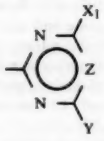
M is an alkali metal or $R_aR_bR_cR_dL^+$;

R_a, R_b, R_c and R_d are independently C_1–C_{18} alkyl, benzyl or phenyl provided that the total number of carbon atoms is not greater than 36;

L is N, P or S, provided that when L is S it is only substituted with R_a, R_b and R_c;

R_1 is H or CH_3;

R_2 is



X_1 is CH_3, OCH_3, OCH_2CH_3, Cl or OCF_2H;

Y is CH_3, OCH_3, $CH(OCH_3)_2$, OCH_2CF_3, $NHCH_3$,

or

OCF_2H; and

Z is CH or N;

provided that when X_1 is Cl, then Z is CH and Y is OCH_3 or OCF_2H and when Y is $NHCH_3$ then X_1 is OCH_3 or OCH_2CH_3.

4,546,180
PROCESS FOR PREPARING PHOSPHITE-ISOCYANURATES OLIGOMERS

Leo L. Valdiserri, and Richard P. Woodbury, both of Belpre, Ohio, assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Continuation of Ser. No. 298,968, Sep. 3, 1981, abandoned. This application filed Apr. 19, 1983, Ser. No. 486,476

Int. Cl.[4] **C07D** *403/12, 403/14*

The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.

U.S. Cl. 544—214 **8 Claims**

1. A process for preparing phosphite-isocyanurate oligomers comprising preparing a mixture of 1.0 mol of tris-hydroxyalkyl

isocyanurate wherein the alkyl is ethyl or 2-methylethyl, from about 0.8 to about 4 mols of a phosphite having the structure

$(RO)_3P$

wherein R is phenyl, alkylphenyl, alkyl or cycloalkyl, the alkyl in each case having 1–9 carbon atoms, and from about 3.0 to about 6.0 mols of an alcohol or alkylphenol having 2–30 carbon atoms, said alcohol or alkylphenol having a higher boiling point then the alcohol or phenol ROH which is derivable from $(RO)_3P$, heating said mixture in the presence of a basic catalyst at from about 50° C. to about 200° C. to form a clear mixture and then distilling away the phenol or alcohol formed during the heating step.

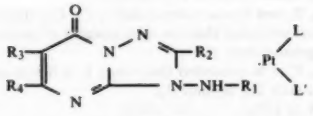
4,546,181

PLATINUM CHELATES OF 3-AMINO-SUBSTITUTED-[1,2,4]TRIAZOLO[1,5-A]-PYRIMIDIN-7(3H)-ONES

Joseph J. Hlavka, Tuxedo; Panayota Bitha, Pomona, and Yang-i Lin, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 22, 1983, Ser. No. 525,530
Int. Cl.[4] C07D *487/04;* A61K *31/505*
U.S. Cl. 544—225 **7 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or formyl; R_2 is hydrogen, alkyl(C_1–C_3) or phenyl; R_3 is hydrogen or alkyl(C_1–C_3); R_4 is alkyl (C_1–C_3) or phenyl; and L and L′ are the same and are anions selected from the group consisting of halide, nitrate, sulfate and (C_2–C_6)alkanoate or L and L′ taken together is a dibasic anion selected from the group consisting of oxalate, malonate, methylmalonate, succinate, tartronate and 1,1-cyclobutane dicarboxylate.

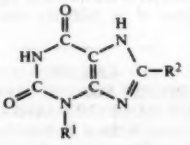
4,546,182

3,8-DIALKYLXANTHINES

Per G. Kjellin, Lund, and Carl G. A. Persson, Löberöd, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

Continuation-in-part of Ser. No. 248,995, Mar. 30, 1981, abandoned. This application Aug. 16, 1983, Ser. No. 523,731
Claims priority, application Sweden, Apr. 18, 1980, 8002910
Int. Cl.[4] C07D *473/06;* A61K *31/52*
U.S. Cl. 544—273 **4 Claims**

1. A compound of the formula



or a physiologically acceptable salt thereof, in which formula R^1 is ethyl, n-propyl, n-butyl, isobutyl, n-pentyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, cyclopropyl, cyclobutyl, or cyclopentyl and R^2 is methyl, ethyl, n-propyl, isopropyl, cyclopropyl, n-butyl, isobutyl, tert. butyl or cyclobutyl provided that

R^1 is ethyl when R^2 is methyl;

when R^2 is ethyl, R^1 is ethyl, n-propyl, n-butyl, isobutyl, n-pentyl, 2-methylbutyl, 3-methylbutyl, 2,2-dimethylpropyl, cyclopropyl, cyclobutyl, or cyclopentyl;

when R^2 is n-propyl, R^1 is ethyl, n-propyl, or cyclopropyl;

when R^2 is isopropyl, R^1 is ethyl or n-propyl;

when R^2 is cyclopropyl, R^1 is n-propyl;

when R^2 is n-butyl, R^1 is ethyl or n-propyl;

when R^2 is isobutyl, R^1 is ethyl or n-propyl;

when R^2 is tert. butyl, R^1 is n-propyl; and

when R^2 is cyclobutyl, R^1 is n-propyl.

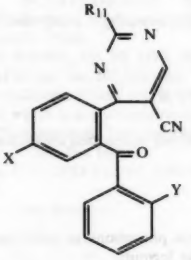
4,546,183

PYRIMIDO-2-BENZAZEPINES

Rodney I. Fryer, North Caldwell; Norman W. Gilman, Wayne; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

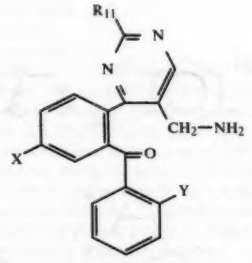
Division of Ser. No. 437,047, Oct. 27, 1982, Pat. No. 4,481,142, which is a continuation of Ser. No. 151,025, May 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 16,709, Mar. 1, 1979, abandoned. This application Aug. 23, 1984, Ser. No. 643,509
Int. Cl.[4] C07D *211/70, 487/04*
U.S. Cl. 544—330 **2 Claims**

1. The compound of the formula



wherein R_{11} is selected from the group consisting of hydrogen, lower alkyl and NR_8R_9 wherein R_8 and R_9 are hydrogen or lower alkyl; X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, ethyl, α-hydroxy ethyl and acetyl and Y is hydrogen or halogen.

2. The compound of the formula



wherein R_{11} is selected from the group consisting of hydrogen, lower alkyl and NR_8R_9 wherein R_8 and R_9 are hydrogen or lower alkyl; X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, ethyl, α-hydroxy ethyl and acetyl and Y is hydrogen and halogen.

4,546,184

PERFLUORO-KETO-YLIDS AS PRECURSORS OF POLYCHLOROKETONES, 1,2-DIKETONES AND QUINOXALINES

Keith B. Baucom, Gainesville, Fla., assignor to SCM Corporation, New York, N.Y.

Filed May 23, 1983, Ser. No. 497,006
Int. Cl.[4] C07D *241/42, 403/04;* C07B *9/00, 7/00*
U.S. Cl. 544—353 28 Claims

1. A process for making a quinoxaline which comprises the steps of:

(a) reacting a phosphorane with an acid halide of a polyoxy perfluoro-alkylene oxide wherein the perfluoro-oxyalkylene group has 2 or 3 carbon atoms and the number of perfluoro-oxyalkylene units is in the range of 2 to 20, to form a keto-ylid;

(b) chlorinating said keto-ylid to form a polychloroketone;

(c) hydrolyzing said polychloroketone to form the corresponding polyketone have one or two

groups therein; and

(d) reacting said polyketone with an o-arylene diamine to form the corresponding quinoxaline.

28. A process for producing a perfluoro-1,2-diketone which comprises the steps of hydrolyzing a perfluoro-poly-chloroketone, with water and silver trifluoroacetate and recovering the 1,2-diketone.

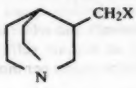
4,546,185

PROCESS FOR THE PREPARATION OF DERIVATIVES OF QUINUCLIDINE SUBSTITUTED IN THE 3 POSITION

Jean-Claude Bondiou, Montrouge; Francoise Hodac, Paris, and Didier Legroux, Domont, all of France, assignors to Pharmuka Laboratoires, Gennevilliers, France

Filed Aug. 11, 1983, Ser. No. 522,288
Claims priority, application France, Aug. 17, 1982, 82 14215
Int. Cl.[4] C07D *453/02*
U.S. Cl. 546—133 8 Claims

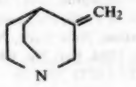
1. Process for the preparation of a compound of the formula:



(I)

in which X is chlorine which comprises the steps of:

a. reacting 3-methylene quinuclidine of the formula:



(II)

in an appropriate solvent and in the presence of a catalytic quantity of a halide of a transition metal, with an aluminum hydride, at a molar ratio

$$\frac{\text{aluminum hydride}}{\text{3-methylene quinuclidine}}$$

of at least 0.6;

b. reacting the product formed in step a in situ with an ester of a saturated aliphatic alcohol having 1 to 6 carbon atoms and a monocarboxylic saturated aliphatic acid having 1 to 6 carbon atoms; and

c. reacting the product formed in step b in situ with an electrophilic reactant capable of yielding an atom of chlorine.

4,546,186

1,4,5,6,7,8-HEXAHYDRO-2-METHYL-5-OXO-4-(2-THIAZOLYL)-3-QUINOLINE CARBOXYLIC ACID 2-METHYL(PHENYLMETHYL)AMINO ETHYL ESTER AND PHARMACEUTICALLY ACCEPTABLE SALTS

Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,423
Int. Cl.[4] C07D *417/04, 401/04;* A61K *31/47*
U.S. Cl. 546—167 1 Claim

1. The compound which is 1,4,5,6,7,8-hexahydro-2-methyl-5-oxo-4-(2-thiazolyl)-3-quinoline carboxylic acid 2-methyl(-phenylmethyl)amino ethyl ester or a pharmaceutically acceptable salt thereof.

4,546,187

PIPERIDINOALKYLTHIO PYRIDINIUM COMPOUNDS

Roger Crossley, and Kay H. Dickinson, both of Reading, England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 351,837, Feb. 24, 1982, Pat. No. 4,415,582, which is a division of Ser. No. 217,925, Dec. 18, 1980, Pat. No. 4,343,805, which is a continuation-in-part of Ser. No. 98,421, Nov. 29, 1979, abandoned. This application Jun. 23, 1983, Ser. No. 507,203
Claims priority, application United Kingdom, Dec. 16, 1978, 48813/78
Int. Cl.[4] C07D *401/12*
U.S. Cl. 546—193 1 Claim

1. A compound which is 1-methyl-2-[(piperidinoethyl)thio]-pyridinium chloride.

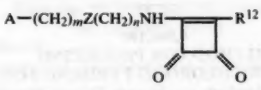
4,546,188

SUBSTITUTED 1,2-DIAMINOCYCLOBUTENE-3,4-DIONES

Aldo A. Algieri, Fayetteville; Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 503,946, Jun. 13, 1983, abandoned, which is a division of Ser. No. 386,566, Jun. 9, 1982, Pat. No. 4,526,973, which is a division of Ser. No. 369,971, Apr. 21, 1982, Pat. No. 4,522,943, which is a continuation-in-part of Ser. No. 264,533, May 18, 1981, Pat. No. 4,390,701. This application Oct. 3, 1984, Ser. No. 657,120
Int. Cl.[4] C07D *213/64, 213/70, 401/12*
U.S. Cl. 546—194 4 Claims

1. A compound of the formula



III

wherein

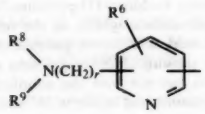
R^{12} is a conventional leaving group selected from halogen, phenoxy, substituted phenoxy and alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is sulfur, oxygen or methylene; and

A is



in which

R^6 is hydrogen, (lower)alkyl, (lower)alkoxy or halogen;

r is an integer of from 1 to 4 inclusive; and

R^8 and R^9 each are indepefidently hydrogen, (lower)alkyl, allyl, propargyl, (lower)alokoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, cyclo(lower)alkyl, or phenyl(lower)alkyl, provided that R^8 and R^9 may not both be cyclo(lower)alkyl, or R^8 and R^9, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, hydroxypiperidino, N-methylpiperazino, 1, 2, 3, 6-tetrahydropyridyl, 3-pyrrolino, homopiperidino, heptamethyleneimino, octamethyleneimino or 3-azabicyclononane.

4,546,189

PREPARATION OF CYANO(6-(SUBSTITUTED PHENOXY)-2-PYRIDINYL)METHYL ESTERS OF 3-(2,2-DIHALOETHENYL)-2,2-DIMETHYLCYCLOPROPANE CARBOXYLIC ACIDS

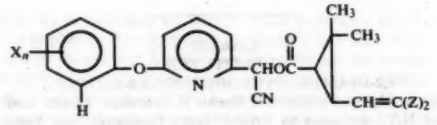
Andrew T. Au, Needham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 350,521, Feb. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 199,392, Oct. 23, 1980, abandoned. This application Apr. 11, 1983, Ser. No. 484,083

Int. Cl.⁴ C07D *213/64*

U.S. Cl. 546—300 **8 Claims**

1. A process for preparing cyano(6-(substituted phenoxy)-2-pyridinyl)methyl esters of 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropane carboxylic acids corresponding to the formula



wherein X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, 3,4-methylenedioxy, chloro, fluoro or bromo; n represents an integer of 0 to 2 and Z represents chloro, fluoro or bromo which comprises reacting a 6-(substituted phenoxy)-picolinaldehyde with a 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropane carboxylic acid anhydride or halide in the presence of an aqueous alkali metal cyanide solution and an organic solvent.

4,546,190

METHOD FOR PRODUCING 3,5,6-TRICHLORO-1H-PYRIDINE-2-ON

Winfried Orth, Hassloch, and Werner Fickert, Mannheim, both of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,910

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1983, 3308800

Int. Cl.⁴ C07D *213/50*

U.S. Cl. 546—303 **5 Claims**

1. A method for producing 3,5,6-trichloro-1H-pyridine-2-on comprising dissolving 6-chloro-1H-pyridine-2-on in an aqueous carboxylic acid solution which, at the reaction temperature, is liquid and inert to chlorine gas and chlorinating in a reaction vessel by passing chlorine gas into a space located above said solution but not into the solution, said reaction temperature being maintained between 15° and 30° C. through cooling.

4,546,191

TRIFLUOROMETHYL-2-PYRIDINONE OR PYRIDINTHIONE COMPOUNDS AND PROCESS FOR THE PREPARATION OF THE SAME

Ryuzo Nishiyama, Osaka; Kanichi Fujikawa, Shiga; Isao Yokomichi, Shiga; Takahiro Haga, Shiga; Kuniaki Nagatani, Shiga, and Kouji Hayashi, Shiga, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Japan

Filed Mar. 19, 1980, Ser. No. 131,719

Claims priority, application Japan, Mar. 19, 1979, 54-32068

Int. Cl.⁴ C07D *211/86*

U.S. Cl. 546—303 **2 Claims**

1. 3-chloro-5-trifluoromethyl-2-pyridone.

4,546,192

CHLORINE EXCHANGE FOR FLUORINE IN RING-FLUORINATED PYRIDINE COMPOUNDS

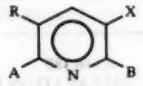
George S. Fujioka, Walnut Creek, and Alexander P. Fung, Pleasant Hill, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 23, 1982, Ser. No. 422,318

Int. Cl.⁴ C07D *213/26*

U.S. Cl. 546—345 **11 Claims**

1. A method of exchanging a chlorine atom for a fluorine atom in a ring-fluorinated pyridine compound which comprises contacting a ring-fluorinated pyridine compound of the formula



wherein

R represents —H, $—CF_3$, $—CF_2Cl$, CCl_2F or $—CCl_3$;

X represents Cl or H; and

A and B each independently represent H, Cl or F with the proviso that at least one of A and B is always F;

with an $FeCl_3$ and/or HCl chlorinating agent in the presence of a metal halide catalyst selected from $FeCl_3$, $SnCl_4$, $TiCl_4$, $TaCl_5$, WCl_6, $NbCl_5$, $CrCl_3$, FeF_3, SnF_4 and CrF_2, or mixtures thereof at a temperature of at least about 80° F. at a pressure of from atmospheric to 80 psig with the proviso that when used as a catalyst $FeCl_3$ is employed in an amount in the range of from about 0.1 to about 20 mol percent based on mols of ring-fluorinated pyridine compounds and when used as a chlorinating agent $FeCl_3$ is used in an amount sufficient to provide at least about one mol of chlorine atoms per mol of fluorine atoms to be displaced.

4,546,193

ANTIARRHYTHMIC CYCLOOCT[B]INDOLES

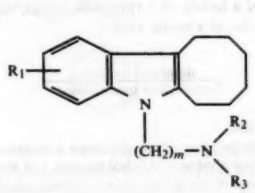
Magid A. Abou-Gharbia, Wilmington, Del.; Meier E. Freed, and Thomas J. Colatsky, both of Paoli, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,211

Int. Cl.⁴ C07D *209/70*

U.S. Cl. 548—448 **9 Claims**

1. A compound of the formula:



in which

R_1 is $-CO_2H$, $-CO_2(CH_2)_n-NR_4R_5$, $-CONR_6R_7$, $-NHCO_2R_8$ or $-NHCO_2(CH_2)_o-NR_9R_{10}$ where R_4 and R_5 are H or alkyl of 1 to 6 carbon atoms and n is 1 to 6; R_6 and R_7 are H or alkyl of 1 to 6 carbon atoms; R_8 is alkyl of 1 to 6 carbon atoms; and R_9 and R_{10} are alkyl of 2 to 6 carbon atoms and o is 1 to 6;

R_2 and R_3 are, independently, hydrogen or alkyl of 1 to 6 carbon atoms; and

m is one of the integers 1, 2, 3 or 4;

or a pharmaceutically acceptable salt thereof.

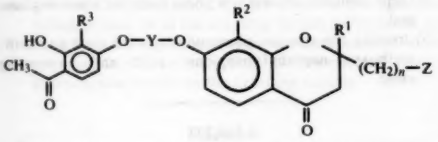
4,546,194

SUBSTITUTED CHROMANON-2-YL ALKANOLS AND DERIVATIVES THEREOF

Masateru Miyano, Northbrook; Clara I. Villamil, Glenview, and Robert L. Shone, Palatine, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed May 29, 1984, Ser. No. 614,893
Int. Cl.⁴ C07D 311/04
U.S. Cl. 549—401 **25 Claims**

1. A compound of the formula:



wherein Y is:

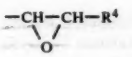
(a) $-(CH_2)_m-$

(b) $-(CH_2)_p-CHOH-(CH_2)_q-$

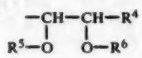
(c) $-(CH_2)_r-CO-(CH_2)_s-$

wherein Z is:

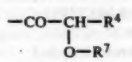
(a)



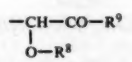
(b)



(c)



(d)



wherein R^1, R^2, and R^3 are alkyl of 1 to 6 carbon atoms, inclusive, each being the same or different;

wherein R^4 is:

(a) hydrogen; or

(b) alkyl of 1 to 6 carbon atoms, inclusive;

wherein R^5 and R^6, each being the same or different, are:

(a) hydrogen; or

(b) alkanoyl of 2 to 6 carbon atoms, inclusive;

wherein R^7 and R^8 are:

(a) hydrogen; or

(b) alkanoyl of 2 to 6 carbon atoms, inclusive;

wherein R^9 is alkyl of 1 to 6 carbon atoms, inclusive;

wherein n is an integer from 1 to 10, inclusive;

wherein m is an integer from 2 to 7, inclusive;

wherein each of p and q is an integer from 1 to 5, inclusive, with the proviso that the sum (p+q) is no greater than 6;

wherein each of r and s is an integer from 1 to 5, inclusive, with the proviso that the sum (r+s) is no greater than 6.

4,546,195

PROCESS FOR THE PRODUCTION OF AMINO-DICARBOXYLIC ACID-BIVALENT METAL-HALOGEN COMPLEXES AND SUCH COMPLEXES

Joachim Helbig, Tutzing, and Hubert Schmidbaur, Garching, both of Fed. Rep. of Germany, assignors to Verla-Pharm, Arzneimittelfabrik, Apotheker H.J.v. Ehrlich GmbH & Co. KG, Tutzing, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,644
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238118
Int. Cl.⁴ C07F 3/06, 11/06
U.S. Cl. 556—50 **7 Claims**

1. A complex compound of the formula

$$(H_2O)_mMe[OOC(CH_2)CH(NH_2)COO]H.Hal$$

wherein Me is calcium, zinc or manganese; Hal is chlorine or bromine, and m=0–3.

2. A process for preparing complex compounds having a 1:1:1 ratio of amino-dicarboxylic acid ions, bivalent metal ions and halogen ions comprising the steps of:

(I) directly combining in an aqueous solution

(i) an amino-dicarboxylic acid selected from the group consisting of glutamic acid and aspartic acid;

(ii) at least one of oxides, hydroxides and carbonates of a metal selected from the group consisting of magnesium, calcium, strontium, zinc and manganese; and

(iii) at least one of

(A) chlorides, bromides or iodides of said metal; and

(B) hydrochloric acid, hydrobromic acid or hydroiodic acid; and

(II) spray drying said aqueous solution.

4,546,196

3-CHLOROBENZYL-3,6-DICHLORO-2-METHOXYBENZOATE

George F. Luteri, Mount Prospect; Leonard J. Stach, Riverside, and Louis G. Nickell, Chicago, all of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 11, 1984, Ser. No. 619,086
Int. Cl.⁴ C07L 69/76
U.S. Cl. 560—65 **4 Claims**

1. The compound, 3-Chlorobenzyl 3,6-Dichloro-2-Methoxybenzoate.

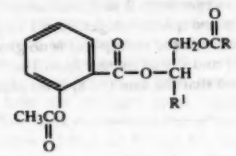
4,546,197

PHARMACEUTICAL COMPOSITION AND PROCESS FOR THE MANUFACTURE THEREOF

Neil E. Bateman, Melbourne, and Ross A. Woods, Brunswick, both of Australia, assignors to R. P. Scherer Corporation, Troy, Mich.

Filed Mar. 24, 1983, Ser. No. 478,488
Claims priority, application Australia, Mar. 24, 1982, PF3284
Int. Cl.⁴ C07C 69/90
U.S. Cl. 560—66 **7 Claims**

1. An analgesic and anti-inflammatory compound having the formula:



wherein both R and R^1 are alkyl radicals.

4,546,198

ASYMMETRIC SYNTHESIS OF ESTERS AND ACIDS

Donald W. Stoutamire, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 458,813, Jan. 18, 1983,. This application Mar. 26, 1984, Ser. No. 593,153
Int. Cl.[4] C07C *69/76;* C07B *19/00, 20/00*
U.S. Cl. 560—105 22 Claims

1. A process for the preparation of an optically-active ester or a mixture enriched therein which comprises reacting a non-symmetrical ketene with a racemic or an optically-active, tertiary-base-substituted alkylcarbinol.

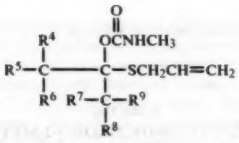
4,546,199

HALOGENATED ALLYLTHIOISOPROPYL N-METHYL CARBAMATES AS HERBICIDE EXTENDERS

Daniel L. Hyzak, Saratoga; Ferenc M. Pallos, Walnut Creek, and Joanna K. Hsu, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 255,209, Apr. 20, 1981, Pat. No. 4,422,869. This application Aug. 29, 1983, Ser. No. 527,503
Int. Cl.[4] C07C *149/20*
U.S. Cl. 560—165 5 Claims

1. A compound having the formula



in which R^4, R^5, R^6, R^7, R^8, and R^9 are independently halogen.

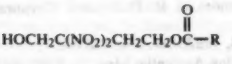
4,546,200

2,2-DINITROBUTANE-1,4-DIOL AND MONOESTERS

Michael E. Sitzmann, Adelphi, and Horst G. Adolph, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1983, Ser. No. 492,277
Int. Cl.[4] C07C *69/52*
U.S. Cl. 560—222 11 Claims

1. An ester of the formula



wherein R is selected from the group consisting of alkyl groups, fluoroalkyl groups, chloroalkyl groups, aryl groups, fluoroaryl groups, chloroaryl groups, aralkyl groups, fluoroaralkyl groups, chloroaralkyl groups, and alkene groups.

4,546,201

PROCESS FOR THE OPTICAL RESOLUTION OF (±)2-(6′METHOXY-2′-NAPHTHYL)-PROPIONIC ACID

Oreste Piccolo, Leghorn; Giovanni Villa, Monticello, and Enrico Zen, Macherio, all of Italy, assignors to Blaschim S.p.A., Milan, Italy

Filed Apr. 23, 1984, Ser. No. 602,744
Claims priority, application Italy, Jul. 27, 1983, 22261 A/83
Int. Cl.[4] C07B *19/00*
U.S. Cl. 562—401 4 Claims

1. A process for the optical resolution of (±) 2-(6′-methoxy-2′-naphthyl)-propionic acid which comprises:
(a) adding from 0.45 to 0.65 mole of (S)-alphaphenylethylamine to each mole of the acid in 3 parts ±15%, with regard to the acid, of chloroform at from 0° to 58° C.,
(b) cooling of the reaction mixture to 0° C.,
(c) filtering the thus obtained precipitate,
(d) suspending the filtrate in chloroform at 15°–58° C.,
(e) cooling of the reaction mixture,
(f) filtering the thus obtained precipitate,
(g) again suspending the precipitate in chloroform and treating this suspension with an aqueous alkaline solution,
(h) separating the chloroform phase from the aqueous phase, and
(i) treating the aqueous phase with acid to yield (+) 2-(6′-methoxy-2′-naphthyl)-propionic acid and recovering same.

4,546,202

PROCESS FOR THE RECOVERY OF COBALT AND MANGANESE FROM OXIDATION RESIDUE INCINERATOR ASH, PYROLYSIS SAND AND PYROLYSIS CHAR

Robert C. Edwards, Naperville, Ill., and F. Austin Golson, Decatur, Ala., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 29, 1983, Ser. No. 555,935
Int. Cl.[4] C07C *51/265*
U.S. Cl. 562—414 2 Claims

1. A process for the recovery of cobalt and manganese from solid aromatic acid oxidation incinerator ash, pyrolysis sand and pyrolysis char, which process comprises heating such solid in the presence of acetic acid, wherein the weight ratio of the acetic acid to the solid is about 1:1 to about 50:1, at a temperature of about 120° to about 300° C. and a pressure of about 3 to about 30 atmospheres, and recovering the cobalt and manganese in liquid solution as the metal acetic acid salt.

4,546,203

FACILE SYNTHESIS OF β-HYDROXY-β-METHYLGLUTARIC ACID

Ernest K. Metzner, Del Mar, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Continuation of Ser. No. 329,654, Dec. 11, 1981, abandoned. This application Mar. 12, 1984, Ser. No. 588,263
Int. Cl.[4] C07C *51/235, 59/245*
U.S. Cl. 562—538 8 Claims

1. A process for preparing β-hydroxy-β-methylglutaric acid which comprises oxidizing 3-methyl-1,3,5-pentanetriol in aqueous media with a permanganate salt.

4,546,204

PROCESS FOR THE MANUFACTURE OF METHYL T-BUTYL ETHER

David Parris, Nunawading, Australia, assignor to Imperial Chemical Industries Australia Limited, Melbourne, Australia

Filed Oct. 29, 1984, Ser. No. 665,973
Claims priority, application Australia, Nov. 7, 1983, PG2244
Int. Cl.[4] C07C *41/05*
U.S. Cl. 568—697 12 Claims

1. A process for the manufacture of methyl t-butyl ether which process comprises the following steps:

(i) cracking a hydrocarbon feedstock in a cracking facility to give an ethylene-rich stream;
(ii) separating an isobutane enriched stream from a C_4-hydrocarbon stream and optionally isomerizing the n-butane and recycling the resulting C_4-hydrocarbon stream for separation;
(iii) contacting a mixture comprising the ethylene-rich stream from step (i) and the isobutane enriched stream from step (ii) with a transhydrogenation catalyst to give a hydrocarbon mixture comprising isobutene and ethane;
(iv) either first separating the hydrocarbon mixture obtained in step (iii) into a C_4-hydrocarbon enriched stream comprising isobutene and a C_2-hydrocarbon enriched stream comprising ethane and second reacting said C_4-hydrocarbon enriched stream comprising isobutene with methanol to give methyl t-butyl ether and a residual C_4-hydrocarbon stream; or first reacting said mixture obtained in step (iii) with methanol to give methyl t-butyl ether and a residual hydrocarbon stream and optionally separating the residual hydrocarbon stream into a residual C_4-hydrocarbon stream and a C_2-hydrocarbon enriched stream; and
(v) collecting the methyl t-butyl ether and recycling the residual C_4-hydrocarbon stream either to the C_4-hydrocarbon stream or to the cracking facility as feedstock and recycling the C_2-hydrocarbon enriched stream to the cracking facility or recycling the unseparated residual hydrocarbon stream to the cracking facility.

4,546,205

STABILIZATION OF ALDEHYDES

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jun. 16, 1982, Ser. No. 389,150
Int. Cl.⁴ C07C *45/86*; C09K *15/16, 15/22*
U.S. Cl. 568—421 **7 Claims**

1. An aldehyde having the formula

$$R_1—S—\underset{\displaystyle R_2}{\underset{|}{CH}}—CH_2CHO$$

wherein R_1 is lower alkyl and R_2 is hydrogen or lower alkyl, said aldehyde containing from 100 to 2000 ppm of a stabilizer for aldehydes consisting essentially of a combination of: (a) a phenolic compound selected from the class consisting of phenols, napthols, or anthranols and mixtures thereof; and (b) an amine selected from the class consisting of pyridine, picoline, lutidine, collidine and quinoline, and mixtures thereof; wherein the phenolic and amine compounds can optionally be substituted with hydrocarbyl, halogen, alkoxy, or hydroxyl groups.

3. A stabilizer for an aldehyde consisting essentially of a substantially equimolar mixture of 4-methoxyphenol and pyridine.

4,546,206

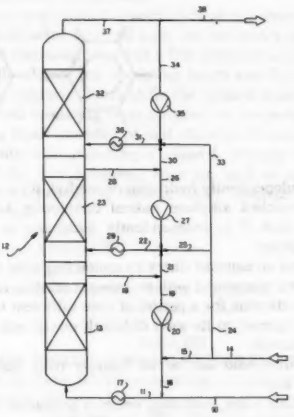
PROCESS FOR PRODUCING METHYL TERT. ALKYL ETHER

Wilhelm Neier; Werner Webers, both of Rheinberg, and Michael Dettmer, Glinde, all of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,657
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322753
Int. Cl.⁴ C07C *41/06, 43/04*
U.S. Cl. 568—697 **18 Claims**

1. The process for producing methyl t-alkyl ether selected from the group consisting of methyl t-butyl ether and methyl t-amyl ether by the reaction of isobutene and isoamylene, respectively, with methanol in the presence of acidic solid catalyst in several reaction stages which comprises

passing to the first reaction stage the total amount of isoolefine charge and a first portion of the methanol charge;
controlling the rate of feed of the first portion of methanol to the first reaction stage whereby the concentration of methanol in the effluent therefrom does not exceed 0.4 w% and the mole ratio of methanol to isoolefine admitted to said first reaction stage does not fall below 0.65:1;



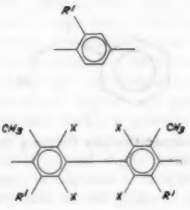
adding the residual portion of methanol to the effluent from the first reaction stage in at least an additional reaction stage; and
maintaining the total mole ratio of methanol to isoolefine at 1–1.2:1.

4,546,207

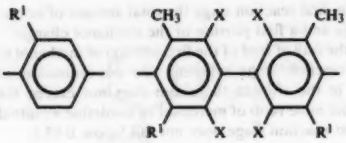
PROCESS FOR PREPARING ANHYDROUS SALTS OF DIHYDROXYAROMATIC COMPOUNDS

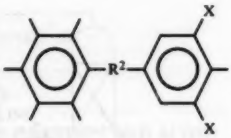
Ashok K. Mendiratta, Schenectady, N.Y., and Subhas K. Sikdar, Boulder, Colo., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 470,856, Feb. 28, 1983, abandoned. This application Jul. 23, 1984, Ser. No. 633,740
Int. Cl.⁴ C07C *37/68*
U.S. Cl. 568—723 **14 Claims**



1. A process for recovering an alkali metal salt of a dihydroxyaromatic compound having the formula HO—Z—OH, wherein Z has the formula





each R^1 is independently hydrogen or methyl, R^2 is a straight-chain or branched alkylene radical containing 1–5 carbon atoms and each X is independently hydrogen or halogen, which comprises:

(A) forming an aqueous slurry by contacting solid dihydroxyaromatic compound with an aqueous solution of an alkali metal hydroxide for a period of time sufficient to convert said compound to its solid di-(alkali metal) salt, or a hydrate thereof;

(B) separating said salt or its hydrate from the aqueous system; and

(C) removing water, including water of hydration, from said salt or hydrate.

4,546,208

PROCESS FOR PREPARING PHENYL ALKANOLS AND PERFUMERY USES OF RESULTING PRODUCTS

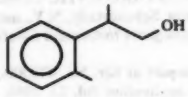
Wilhelmus J. Wiegers, Red Bank, and Mark A. Sprecker, Sea Bright, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 482,823, Apr. 7, 1983, Pat. No. 4,512,918. This application Mar. 14, 1984, Ser. No. 589,534

Int. Cl.[4] **C07C** *29/132, 29/00*

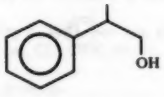
U.S. Cl. 568—814 **3 Claims**

1. A process for preparing the substantially pure compound having the structure:

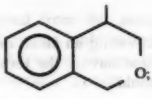


comprising the steps of:

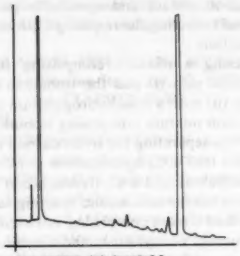
(i) reacting the compound having the structure:



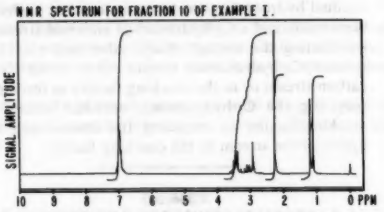
with formaldehyde thereby forming the compound having the structure:



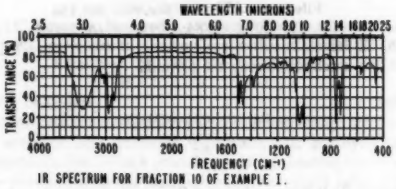
(ii) reacting the compound having the structure:



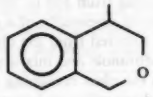
GLC PROFILE FOR EXAMPLE I.



NMR SPECTRUM FOR FRACTION 10 OF EXAMPLE I.



IR SPECTRUM FOR FRACTION 10 OF EXAMPLE I.

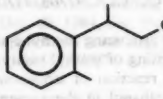


with hydrogen in the presence of a hydrogenation catalyst and an acid selected from the group consisting of mineral acids, citric acid, trichloroacetic acid, dichloroacetic acid and monochloroacetic acid, the reaction being carried out at a temperature in the range of from about 25° C. up to about 200° C. at a pressure in the range of from about 50 psig up to about 1000 psig, the weight ratio of hydrogenation catalyst:acid varying from about 0.1:1 up to about 1:0.1, with the provisos that:

(a) when the acid is citric acid no additional solvent is present; and

(b) when the acid is an acid other than citric acid the reaction takes place in a solvent which is inert to the reactants and reaction product

and then fractionally distilling the substantially pure reaction product having the structure:



from the reaction mass.

4,546,209

ELECTRICAL COMPONENT COMPRISING AN ELECTRIC CIRCUIT ELEMENT HAVING LEADS WHICH ARE CENTERED WITH RESPECT TO THE WALLS OF A HOUSING

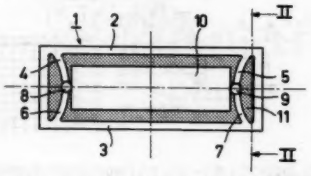
Andries C. Maijers, and Jan Vos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1984, Ser. No. 589,242

Claims priority, application Netherlands, Mar. 24, 1983, 8301046

Int. Cl.[4] H01G *1/035*

U.S. Cl. 174—52 PE 4 Claims



1. An electrical component comprising an electric circuit element encapsulated in an electrically insulating material which secures the circuit element in a housing which is open on one side, said circuit element having two external mutually parallel leads which are parallel to the end faces of the circuit element, characterized in that two pairs of resilient clamping members extend from opposite inside longitudinal walls of the housing, and the clamping members of each pair converge and clamp one external lead of the circuit element between the ends of the clamping members of that pair.

4,546,210

LITZ WIRE

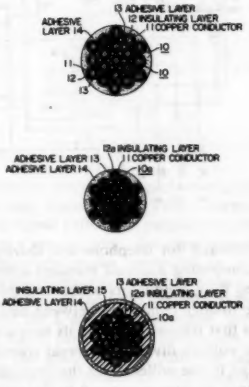
Yutaka Akiba, Fujisawa; Toshio Futami, Mobara, and Teruo Suda, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 500,903

Claims priority, application Japan, Jun. 7, 1982, 57-96124; Jun. 7, 1982, 57-96125

Int. Cl.[4] H01B *7/02*

U.S. Cl. 174—114 R 10 Claims



3. A litz wire formed of a pluarlity of twisted strands, each of the strands comprising a conductor covered with an insulating layer, wherein said insulating layer of each of said strands is covered over the peripheral surface thereof with a first adhesive layer for effecting adhesion between adjacent strands and the adjacent first adhesive layers are fused together to fix the twisted strands; the film thickness of the insulating layer on each of said strands being selected to provide a finished outer diameter (d) which is defined by

$$de < d \leqq 0.93\ de^{0.95}$$

wherein de is the diameter of the conductor.

4. A litz wire comprising:

a plurality of twisted strands, each of said strands comprising a conductor covered over the periphery thereof with a first insulating layer and a first adhesive layer formed over each of said first insulating layers and fused to adjacent first adhesive layers to fix the twisted strands; and

a second insulating layer covered on the peripheral surface of a fixed assembly of said plurality of twisted strands.

6. A litz wire according to claim 4, wherein the film thickness of the first insulating layer on each of said strands, is selected to provide a finished outer diameter (d) which is defined by

$$de < d \leqq 0.93\ de^{0.95}$$

wherein de is the diameter of the conductor.

4,546,211

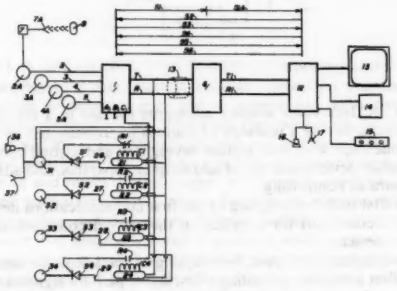
REMOTE DIGITAL CONTROL TRANSMITTER DEVICE

William H. Fane, III, Crestwood, Ky., assignor to MED-CALL, Louisville, Ky.

Filed Sep. 16, 1982, Ser. No. 419,042

Int. Cl.[4] H04M *11/04*

U.S. Cl. 179—2 A 12 Claims



1. A telecommunication system to operate a selected operating device including a digital code generating device to selectively generate first and second coded signals and having at least one actuating input to receive an actuating signal, a digital coded signal output where upon receipt of said actuating signal at said actuating input said digital code generating device supplies said first coded signal to said digital coded signal output, and a receiver code input; actuating signal generating means; receiver means connected to said digital coded signal output having a receiver input to receive said first and second coded signals, a receiver code output connected to said receiver code input of said digital code generating device and receiver code generator device to generate first receiver coded signals and second receiver coded signals and supply said first receiver code signal to said digital code generating device receiver code input in response to receipt of said first coded signal, and supply said second receiver coded signal to said digital code generating device receiver code input in response to receipt of said second coded signal where said first receiver coded signal causes said digital code generating device to generate said second coded signal at said digital coded signal output; latch means operated by the digital code generating

device to actuate said operating device upon receipt of said actuating signal; and a third receiver code generating device to selectively provide a third receiver coded signal at said receiver code output and supply said third receiver coded signal to said receiver code input of said digital code generating device to deactivate said latch means to terminate operation of said operating device.

4,546,212

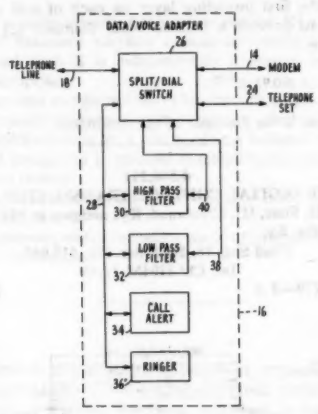
DATA/VOICE ADAPTER FOR TELEPHONE NETWORK

Jack L. Crowder, Sr., Mountain View, Calif., assignor to Crowder, Inc., Mt. View, Calif.

Continuation-in-part of Ser. No. 587,370, Mar. 8, 1984, abandoned. This application Aug. 13, 1984, Ser. No. 640,308

Int. Cl.[4] H04M *11/06*

U.S. Cl. 179—2 C **14 Claims**



1. A data/voice adapter apparatus for use in a telephone network having a plurality of stations interconnected by telephone lines, with each station having first and second communication devices and one of said adapter apparatus, said adapter apparatus comprising:

a first port for coupling to the first communications device;

a second port for coupling to the second communications device;

a telephone line port for coupling to the telephone line;

filter means for providing a first signal path for signals above a first predetermined frequency and a second signal path for signals below a second predetermined frequency;

switching means for providing a first switch mode wherein said first signal path is coupled between said first port and said telephone line port and said second signal path is coupled between said second port and said telephone line port and a second switch mode wherein said first, second and telephone line ports are coupled together.

4,546,213

MODEM SECURITY DEVICE

William J. Dick, 281 Fairhaven Blvd., Woodbury, N.Y. 11797

Filed Apr. 25, 1984, Ser. No. 603,567

Int. Cl.[4] H04M *11/00*

U.S. Cl. 179—2 A **11 Claims**

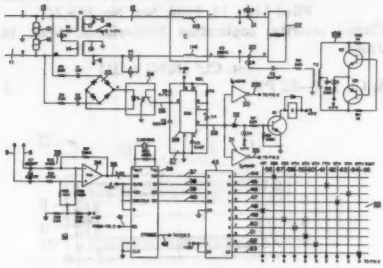
1. A circuit device for preventing unauthorized communication with an automatic-answering modem comprising:

connection means for coupling to a telephone line including first means responsive to a line ringing signal on the telephone line for terminating the line with an appropriate impedance for a predetermined time interval;

terminal means for coupling to the modem;

decoding means responsive to a preselected sequence of dial signals on the telephone line during the predetermined interval for actuation thereof;

second means responsive to the actuation of the decoding means for activating the modem and for coupling the terminal means to the connection means, and wherein the



connection means includes third means responsive to the activation of the modem for maintaining the coupling between the terminal means and the connection means and for maintaining the termination of the telephone line by the first means thereby to establish communication between the modem and the telephone line.

4,546,214

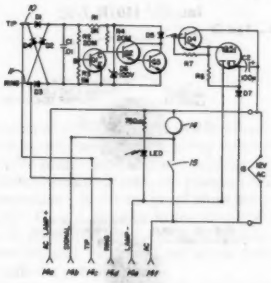
LINE USE INDICATOR FOR TELEPHONE SETS SHARING A SINGLE LINE

Graham S. Laing, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 22, 1983, Ser. No. 564,499

Int. Cl.[4] H04M *3/22*

U.S. Cl. 179—81 C **6 Claims**

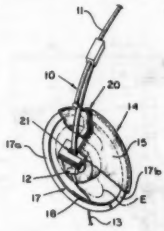


1. A line indicator for telephone sets sharing a single telephone line, comprising a circuit installed across the line, between Tip and Ring conductors of the line, the circuit including a voltage divider connected between said Tip and Ring conductors, a first transistor having its base connected to the center of the voltage divider, a second transistor having its base connected to the collector of the first transistor, a third transistor having its base connected to the emitter of the second transistor, and a light emitting device connected between one of said Tip and Ring conductors and the collectors of said second and third transistors, the emitters of said first and third transistors being connected to the other of said Tip and Ring conductors.

4,546,215
DETACHABLE EARMUFFS FOR HEADSETS

Michael V. Ferraro, 1048 W. Oakdale, Chicago, Ill. 60657

Filed Oct. 7, 1983, Ser. No. 539,800
Int. Cl.[4] H04R 1/02
U.S. Cl. 179—156 R 21 Claims



1. A detachable earmuff for use with a headset, and comprising:

an earmuff body adapted to cover a users ear and an earphone held to the ear by means of a headband;

resilient frame means in assembly with said body;

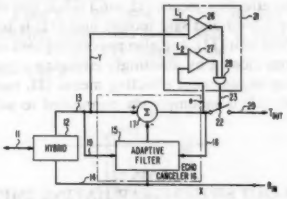
said assembly having an entrance separation extending inwardly from a perimeter to a headband clearance located substantially inwardly from said perimeter;

and said frame means providing structure along said entrance separation normally biasing said entrance separation closed, but adapted to be resiliently flexed for opening said entrance separation for passage therethrough of said headband when mounting the earmuff on or removing the earmuff from said headset.

4,546,216
ECHO SUPPRESSOR FOR IMPROVING ECHO CANCELER PERFORMANCE

Ronald H. Tegethoff, Tinton Falls, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 27, 1983, Ser. No. 461,436
Int. Cl.[4] H04B 3/20
U.S. Cl. 179—170.2 3 Claims



1. Apparatus for preventing spurious response signals, from an echo canceler connected between a receiving signal path and a sending signal path, from propagating along the sending signal path to a remote point, the apparatus comprising:

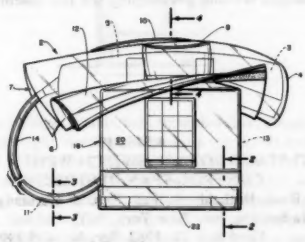
signal comparison means connected to receive (a) a first input signal propagating in the sending signal path before the connection of the echo canceler to the sending signal path, and (b) a second input signal propagating in the sending signal path after the connection of the echo canceler to the sending signal path, the signal comparison means comprising means for (1) comparing the first input signal, propagating along the sending signal path before the interconnection thereto of the echo canceler, with a first predetermined threshold signal level, and (2) comparing the second input signal, propagating in the sending signal path after the interconnection thereto of the echo canceler, with a second predetermined threshold signal level which is different than the first predetermined threshold signal level, said signal comparison means being arranged to generate (i) a first output control signal when both the first input signal is below the first predetermined threshold signal level and the second input signal is equal to or above the second predetermined threshold signal level indicative of a spurious response signal from the echo canceler, and (ii) a second output control signal at all other times; and

switching means responsive to the first output control signal from the signal comparison means for opening the sending signal path after the interconnection of the echo canceler to the sending signal path, and responsive to the second output signal from the signal comparison means for closing the sending signal path.

4,546,217
TELEPHONE SANITARY COVER

John L. Frehn, 44742 Elm Ave., Lancaster, Calif. 93534

Filed Oct. 27, 1983, Ser. No. 546,167
Int. Cl.[4] H04R 1/12
U.S. Cl. 179—185 9 Claims

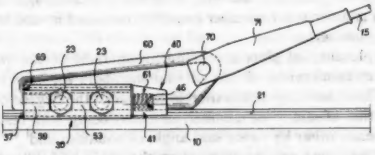


1. A sanitary cover for a telephone comprising: a sleeve-like member of a thin, flexible material, closed on one end and having an opposite open end to receive and retain therein a telephone handset; said sleeve-like member having, on its exterior surface intermediate said open end and said closed end, a first pouch and a second pouch, having opposed inlets to receive and retain therein fingers of a hand to grasp and retain said telephone handset; and, a flap section integral with said sleeve-like member on its exterior surface, to overlap and cover said telephone handset having a sealing means along a majority of its periphery adapted to join said flap section to the exterior surface of said sleve-like member, whereby said handset is entirely encompassed by said sanitary cover.

4,546,218
SUSPENSION SYSTEM FOR AN OVERHEAD CONTACT WIRE FOR ELECTRIC TRACTION VEHICLES

André Ruellan, Enghien les Bains, France, assignor to C. Delachaux, Gennevilliers, France

Filed Dec. 1, 1983, Ser. No. 557,358
Claims priority, application France, Dec. 8, 1982, 82 20560
Int. Cl.[4] B60M 1/20
U.S. Cl. 191—40 12 Claims



11. Clamping apparatus for supporting an overhead contact wire from a carrier cable comprising:

a link member connected between the contact wire and said carrier cable;

a jaw assembly clamping to the contact wire and to the link member, and having first and second relatively movable and mutually clampable jaws, the jaw assembly further defining a generally cylindrical housing having an axis 0—0 running parallel to the axis of the contact wire when clamped between the jaws of said assembly, said axis 0—0 then being close to the axis of the contact wire, and said housing having inwardly directed teeth projecting from a major portion of its inside surface for engagement with said link member to set said link member in any one of a plurality of desired angles about said axis 0—0 relative to said jaw assembly;

said jaw assembly further defining a stop wall to prevent the link member received in said housing from moving axially in one direction along the axis 0—0 and a space adjacent to said housing for receiving said link member when moved in the opposite direction along said axis 0—0, said space being free from obstructions to rotation of said link member about said axis 0—0, thereby enabling the angle at which said link member is set in said housing to be changed without unclamping the jaw assembly.

4,546,219

MULTI-STAGE ROTARY SWITCH WITH A VARIABLE CONTROL-SPAN RESTRICTION

Jochen Rose, Röthenbach, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,299

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139205

Int. Cl.⁴ H01H *19/58, 21/02, 21/78*

U.S. Cl. 200—11 R **18 Claims**

1. A multi-positionable rotary switch having a plurality of electrically conductive switch positions separated from each other by a given angle of rotation, said rotary switch comprising:

a housing member defining a centrally located aperture;

an annular rotor member rotatably mounted in said housing member;

a plurality of slots extending along radii of the rotating circumference of one of said members for receiving at least one stop means therein to restrict the degree of rotation of said rotor member, said slots being with respect to each other by twice said angle of rotation; and

at least one projecting stop on the other of said members positioned to contact said stop means when said stop means are inserted into said slots.

4,546,220

IMPROVED PLUG-IN ELECTRIC SWITCH

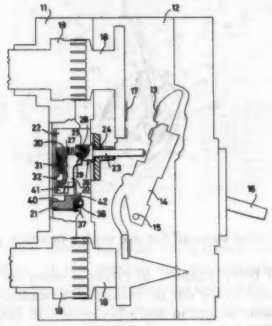
Angelo Mostosi, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

Filed Oct. 3, 1983, Ser. No. 538,755

Claims priority, application Italy, Oct. 7, 1982, 23119/82[U]

Int. Cl.⁴ H01H *9/20*

U.S. Cl. 200—50 AA **16 Claims**



1. A plug-in electric switch comprising a mobile unit (12) and a fixed unit (11), said mobile unit (12) having main contacts (13, 17) opened and closed by a support arm (14) on the mobile unit, means (15) movably mounting said support arm (14) relative to said mobile unit (12) to effect opening of said main contacts (13, 17), secondary contacts (18, 19) removably connecting said fixed unit (11) to said mobile unit (12), said mobile unit (12) having guide means (22, etc.) slidably and nonrotatably guiding a latch (20) on said mobile unit relative to said mobile unit (12), means (21, etc.) carried by said fixed unit (11) for cooperatively effecting latching engagement with said latch (20) when said main contacts (13, 17) are closed and said latch (20) is in a first latching position and effecting unlatching disengagement of said latch (20) when said main contacts are open and said latch (20) is in a second unlatched position displaced from said first latched position, said latch (20) carries means (41) preventing latching engagement with said latching engagement effecting means (21, etc.) when said main contacts (13, 17) are closed and said mobile unit (12) is being plugged into said fixed unit (11), and also preventing said main contacts (13, 17) from closing by abuttingly engaging a portion (42) of said latching engagement effecting means (21, etc.) when said mobile unit (12) is incompletely connected to said fixed unit (11).

4,546,221

DRAW-OUT SWITCHGEAR HAVING IMPROVED DISCONNECT CONTACTS

Jean-Marc Lehmann, Eybens; Raymond Soboul, Autrans, and Marcel Macaire, Saint-Engrève, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Feb. 29, 1984, Ser. No. 584,898

Claims priority, application France, Mar. 2, 1983, 83 03537

Int. Cl.⁴ H01H *1/50, 9/00*

U.S. Cl. 200—50 AA **5 Claims**

1. A draw-out electrical switchgear having separable contacts and comprising:

a pair of terminal clamps arranged at the ends of bushings in electrical connection with the separate contacts of said draw-out switchgear;

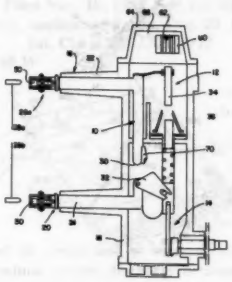
a pair of fixed terminal stabs cooperating with said aligned terminal clamps in the engaged position of said switchgear;

each terminal clamp having a conductive support member fixed to the end face of the corresponding bushing, and at

least a pair of oppositely disposed contact fingers mounted on said fixed conductive support member to enable limited centering movement of said fingers;

biasing means including springs which exert contact pressure on said contact fingers;

a pair of lateral U-shaped slides symmetrically extending in relation to the mid-plane of each terminal clamp, and



being rigidly fixed to said conductive support member on either side of said contact fingers so as to define a guiding passage parallel to the engagement direction;

said fixed terminal stab being inserted within said guiding passage, the distance separating the two slides generally corresponding to the width of the corresponding terminal stab so as to ensure the locking of the terminal clamp in the engaged position of said switchgear.

4,546,222

VACUUM SWITCH AND METHOD OF MANUFACTURING THE SAME

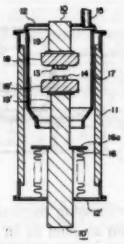
Ryuji Watanabe, Ibaraki; Akira Wada, Hitachi; Hisashi Ando, Hitachi; Seiki Shimizu, Hitachi; Yukio Kurosawa, Hitachi, and Kiyoji Iwashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 29, 1984, Ser. No. 584,903

Claims priority, application Japan, Mar. 4, 1983, 58-36452

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **25 Claims**



1. A vacuum switch comprising a vacuum container and a pair of contact electrodes, in which at least one of said contact electrodes is constituted by a skeleton containing cobalt as its principal component and having air gaps into which an alloy containing copper, silver, and a low melting point and high vapor pressure element having substantially no or very low solid-solubility with respect to the copper at room temperature is impregnated.

4,546,223

HIGH VOLTAGE METAL-CLAD CIRCUIT BREAKER

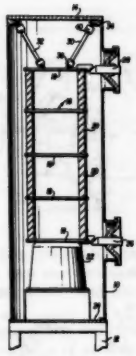
Bernard Jacquemet, St. Simeon de Bressieux, and Jean-Paul Ravet, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Mar. 29, 1983, Ser. No. 480,016

Claims priority, application France, Apr. 5, 1982, 82 06017

Int. Cl.⁴ H01H *33/54*

U.S. Cl. 200—148 R **8 Claims**



1. A high voltage, metal-clad circuit breaker, comprising: an elongated gas tight metal tank having a top cover and a lower bottom and filled with a high dielectric strength gas, an active part having a column-like shape and placed in said tank of the circuit breaker, the active part having an upper part and a lower part, insulating feet lying on the lower bottom of the tank and supporting the lower part of said active part, and at least two elastic stays secured to the upper part of said active part and to said tank for exerting a radial component to maintain the active part in position.

4,546,224

ELECTRIC SWITCH IN WHICH THE CONTROL LEVER TRAVEL IS ARRESTED IF THE CONTACTS BECOME WELDED TOGETHER

Angelo Mostosi, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

Filed Oct. 3, 1983, Ser. No. 538,754

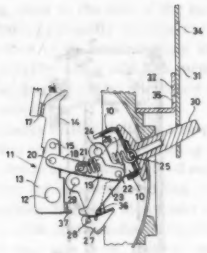
Claims priority, application Italy, Oct. 7, 1982, 23118/82[U]

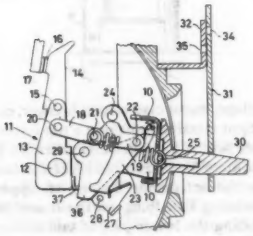
Int. Cl.⁴ H01H *5/06*

U.S. Cl. 200—153 G **9 Claims**

1. An electric switch comprising fixed (17) and movable (16) contacts, said movable contact (16) being carried by a movable arm (11), means (12) mounting said arm (11) for movement between a first position (FIG. 2) at which said fixed (17) and movable (16) contacts are in closed contacting relationship and a second position (FIG. 3) at which said fixed (17) and movable (16) contacts are in open noncontacting relationship, a control lever (10), means (29) mounting said control lever (10) for movement between first (FIG. 2) and second (FIG. 3) positions thereof corresponding to the closed and open positions respectively of said contacts (16, 17), a toggle linkage (18, 19) including a plurality of links (18, 19) operatively interconnected between said arm (11) and said control lever (10), spring biasing means (26) connected between said toggle linkage (at 21) and said control lever (at 25) for moving said arm (11) from said first position thereof (FIG. 2) to said second position thereof (FIG. 3) and from said second position thereof (FIG. 3) to said first position thereof (FIG. 2) upon movement of said control lever (10) respectively from said first position thereof (FIG. 2) to said second position thereof (FIG. 3) and from said second position thereof (FIG. 3) to said first position thereof (FIG. 2) absent said contacts being welded together in the

closed position thereof, said plurality of links (18, 19) being disposed generally in-line in the closed contact position (FIG. 2) and out of alignment in the open contact position (FIG. 3), means (36, 37) for preventing movement of said control lever (10) to said second position thereof (FIG. 3) upon said contacts being welded together (FIG. 4), and said movement preventing means (36, 37) being cooperative abutment means (37) of said arm (11) and abutment means (36) of said control lever (10) which abuttingly contact each other only during immobilization of said arm (11) due to the welded contacts (16, 17, FIG. 4) and the retained in-line relationship of said plurality of links (18, 19) as said control lever (10) is moved toward but not to the second position thereof.





4,546,225

BEARING SUPPORT FOR MICROWAVE OVEN ANTENNA

Patrick R. McCammon, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed May 7, 1985, Ser. No. 731,439
Int. Cl.[4] H05B *6/72*
U.S. Cl. 219—10.55 F **12 Claims**

1. A microwave oven, comprising:

a microwave cavity comprising side walls, a back wall, a floor and a ceiling;

a waveguide positioned above said ceiling;

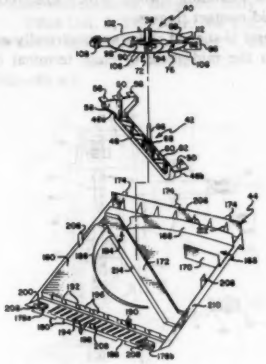
an aperture communicating from said waveguide through said ceiling to said cavity;

a bracket having an arm spaced from said ceiling underneath said aperture, said bracket having a vertical bearing post extending through said aperture into said waveguide;

a metal stub having a hollow bore inserted down over said bearing post for rotatably supporting said stub on said post, said stub extending from said waveguide through said aperture into said cavity;

a primary radiator coupled to the bottom end of said stub in said cavity;

means for energizing said waveguide with microwave energy wherein said stub couples said microwave energy



from said waveguide into said cavity for radiation from said primary radiator; and

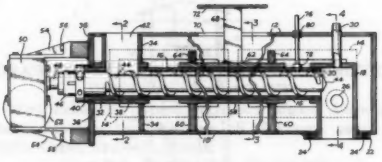
means for rotating said stub on said post.

4,546,226

METHOD AND APPARATUS FOR THE CONVEYING AND RADIO FREQUENCY PROCESSING OF DIELECTRIC MATERIALS

John F. Trembley, Loudonville, N.Y., and John L. Hull, Huntington Valley, Pa., assignors to Entron Technologies, Inc., Franklin, Tenn.

Filed Apr. 29, 1982, Ser. No. 372,926
Int. Cl.[4] H05B *6/46*
U.S. Cl. 219—10.81 **12 Claims**



1. The method of processing particulate dielectric material while conveying it from an inlet to an outlet, comprising:

(a) interposing between said inlet and outlet an elongated conveyor tube containing an elongated rotary screw conveyor,

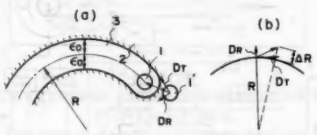
(b) transmitting RF energy diametrically through the tube and hence the space between the tube and screw conveyor flights, and

(c) introducing particulate dielectric material into the tube at said inlet for movement by the rotary screw conveyor to said outlet, whereby the particulate material is exposed to the RF energy in said space.

4,546,227
METHOD OF REDUCING WIRE-CUT ELECTRIC DISCHARGE MACHINING ERRORS

Gotaro Gamo; Mitsuo Kinoshita, both of Hachioji, and Haruki Obara, Sagamihara, all of Japan, assignors to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP81/00344, § 371 Date Aug. 25, 1982, § 102(e) Date Aug. 25, 1982, PCT Pub. No. WO82/02164, PCT Pub. Date Jul. 8, 1982
PCT Filed Nov. 18, 1981, Ser. No. 413,381
Claims priority, application Japan, Dec. 29, 1980, 55-185431
Int. Cl.[4] B23P *1/08, 1/12*
U.S. Cl. 219—69 W 3 Claims



1. A method of controlling a wire-cut electric discharge machine to produce electric discharge between a cutting wire and a workpiece while they are relatively moving at a commanded speed for electric discharge cutting of the workpiece into a commanded shape, comprising the steps of:

detecting an amount of flexing of said wire electrode while the workpiece undergoes electric discharge cutting;

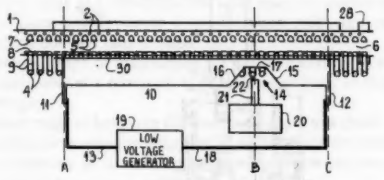
calculating from the detected amount of flexing a calculated cutting condition including at least one of the commanded speed and an interval of time in which relative movement between the wire electrode and the workpiece is arrested as a condition for electric discharge cutting or a corner; and

controlling said relative movement under the calculated cutting condition while the corner is being cut.

4,546,228
APPARATUS FOR WELDING CONNECTIONS OF COMPONENTS

Bernard Bonhomme, Messigny et Vantoux, France, assignor to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,413
Claims priority, application France, Dec. 15, 1982, 8221042
Int. Cl.[4] B23K *1/08*
U.S. Cl. 219—85 R 15 Claims

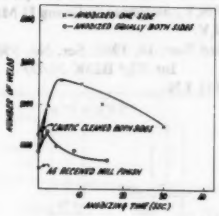


1. An apparatus for welding connections and components, comprising: an electrically conducting heating tube having ends connected to an electric power supply, for preheating the connections and components, an opening over the entire length of an upper generating line of the tube and also having at a given point of a lower part of the tube a notch, a welding station arranged in said notch, together with a device for moving along the heating tube the components mechanically held by conductive elements, which form the connections after welding, said heating tube in the area of said notch having at least one electrically conductive bridge, which compensates in cross-section the notch, to prevent overheating at said point.

4,546,229
METAL PRETREATMENT FOR RESISTANCE SPOT WELDING OF ALUMINUM

Gino L. Leone, Jonquiere, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed May 2, 1984, Ser. No. 606,354
Claims priority, application Canada, Feb. 15, 1984, 447465
Int. Cl.[4] B23K *11/16;* C25F *1/00*
U.S. Cl. 219—118 16 Claims



10. A resistance welding process for joining aluminum sheet members each having two surfaces initially bearing a non-uniform mill finish oxide layer, said method comprising the steps of:

(a) removing the non-uniform mill finish oxide layer from each of the two surfaces of at least the portions of the sheet members to be welded,

(b) providing a very thin oxide layer on one surface and a thicker oxide layer on the other surface of each of the sheet members after the removal of the mill finish, thereby creating a differential in oxide thickness between the surfaces of the sheet members,

(c) bringing said sheet members into resistance joining relationship, for interposition between welding electrodes, with the very thin oxide layers of the two sheet members respectively situated to contact the welding electrodes,

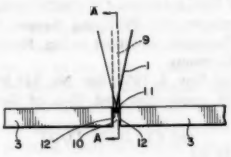
(d) bringing said electrodes into forced contact with the sheet members, and

(e) passing sufficient electric current between said electrodes to locally fuse said sheet members together and provide a resistance welded joint.

4,546,230
WELDING PROCESS USING LASER BEAM

Hiroaki Sasaki, Yotsukaido; Noboru Nishiyama, Ichihara, and Akio Kamada, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP83/00004, § 371 Date Sep. 8, 1983, § 102(e) Date Sep. 8, 1983, PCT Pub. No. WO83/02414, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 7, 1983, Ser. No. 537,454
Claims priority, application Japan, Jan. 8, 1982, 57-1057
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121 LD 5 Claims



1. A welding process using a laser beam for joining mating metal pieces by converging the laser beam toward a see-through groove formed between opposed butting edges of the two metal pieces without use of any backing strip, wherein a

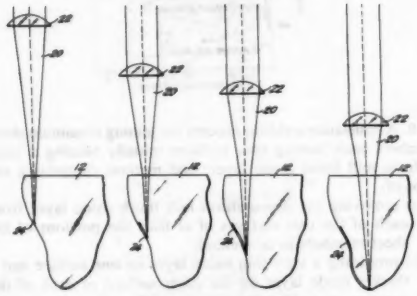
filler wire is continuously supplied into said see-through groove, the gap of said see-through groove being in a range between 0.1 mm and double the diameter of the filler wire, and a converged spot of the laser beam is only on the filler wire to effect welding along said see-through groove.

4,546,231

CREATION OF A PARTING ZONE IN A CRYSTAL STRUCTURE

Herbert D. Gresser, Plainview, and Joseph Nussenbaum, New York, both of N.Y., assignors to Group II Manufacturing Ltd., Hicksville, N.Y.

Filed Nov. 14, 1983, Ser. No. 550,786
Int. Cl.⁴ B23K *26/00*
U.S. Cl. 219—121 LN **7 Claims**



1. The method of providing a thin parting zone in a crystal material for separating the crystal into multiple parts comprising the steps of:

preparing an entrance window on the outer surface of the crystal, said window being adapted to transmit a beam of energy,

focusing an energy beam on a point zone of energy absorbing material in said crystal spaced from said window,

the axis of said beam from said point zone to said window being within the crystal,

generating an energy absorbing zone at the focal point of said beam,

scanning the focal point of said beam through a succession of overlapping potential damage cells along a predetermined parting zone within the crystal to provide a plurality of actual damage cells comprised of shattered material as a parting surface for the crystal, a portion of said damage cells being within the interior of said crystal, and

determining the succession of said potential damage cells such that none of the previously generated actual damage cells lie along the path of said beam between the actual damage cells being generated and the window.

4,546,232

METHOD FOR THE TOPICALLY PRECISE SUBSEQUENT ENGRAVING OF PRINTING CYLINDERS

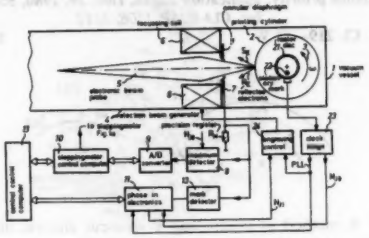
Siegfried Beisswenger, and Wolfgang Boppel, both of Preetz, Fed. Rep. of Germany, assignors to Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Nov. 3, 1983, Ser. No. 548,519
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240654
Int. Cl.⁴ B23K *15/00*
U.S. Cl. 219—121 EJ **7 Claims**

1. A method for topically precise alignment to permit subsequent-engraving of a printing cylinder which was previously engraved, comprising the steps of:

(a) engraving a series of successively disposed cups or the like to form a cup track on a circumferential line of an as yet unengraved printing form associated with the printing cylinder before actual engraving, said cups serving as reference marks for an axial feed and start of the subsequent-engraving in a circumferential direction;

(b) after the printing cylinder has been mounted in the engraving machine for subsequent-engraving, placing in rotation the printing cylinder and moving a scanner over the previously engraved cup track axially relative to the printing cylinder;



(c) identifying a maximum of the signals received from the scanner and retaining a location of the maximum in the cup track as a reference value for the axial feed during the following engraving;

(d) providing said cup track previously engraved on the circumferential line with at least one defined gap that is free of cups; and

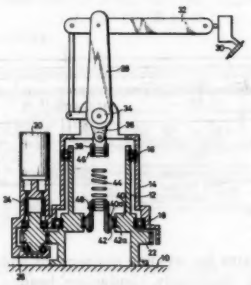
(e) identifying a first cup following the gap by means of the scanner and evaluating it as a reference location for a start of engraving in the circumferential direction for the following subsequent-engraving.

4,546,233

ROBOT ARM HAVING BEARING SUPPORT

Hirotoshi Yasuoka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,216
Claims priority, application Japan, Jan. 26, 1983, 58-10882
Int. Cl.⁴ B23K *9/12*
U.S. Cl. 219—125.1 **10 Claims**



1. A robot comprising:

a generally cylindrical stationary table adapted to be fixed on a floor, and having an outer peripheral surface formed with a circumferential gear;

a rotary table supported rotatably about said outer peripheral surface of said stationary table;

a first motor fixed on said rotary table and having an output shaft operably connected to a motor gear, said motor gear meshing with said circumferential gear to thereby rotate

said rotary table about said stationary table when said first motor is energized;

a front arm carrying a working member at its free end;

an upper arm supported tiltably on said rotary table, and having an upper end on which the other end of said front arm is supported;

a second motor provided on said upper arm for tilting said upper arm; and

a tension spring having one end connected to the lower end of said upper arm, and the other end connected to said stationary table at a bearing point about which said rotary table is rotatable.

4,546,234

OUTPUT CONTROL OF SHORT CIRCUIT WELDING POWER SOURCE

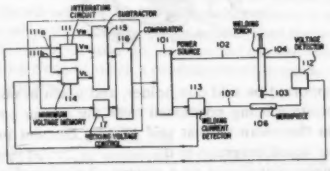
Takaaki Ogasawara; Tokuji Maruyama, both of Yokohama; Masaharu Sato, Kanagawa; Yukio Hida, Kanagawa, and Takashi Saito, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 4, 1984, Ser. No. 596,686

Claims priority, application Japan, Aug. 11, 1983, 58-147632; Aug. 11, 1983, 58-147633; Nov. 12, 1983, 58-212872; Nov. 12, 1983, 58-212873; Nov. 17, 1983, 58-217288; Jan. 6, 1984, 59-1128

Int. Cl.⁴ B23K *9/09*

U.S. Cl. 219—137 PS **14 Claims**



1. A method for controlling the output of a power source in consumable electrode arc welding in which a short circuiting phase and an arcing phase alternately take place between a consumable electrode and a workpiece in a shielding gas atmosphere, which comprises:

a first stage of maintaining the output welding current at a first value at a relatively low level upon establishment of a short circuit across a gap between said consumable electrode and said workpiece;

a second stage of maintaining the welding current at a second value at a relatively high level subsequent to the first stage;

a third stage of lowering the welding current to a third value at a low level upon detection of necking as a premonition of rupture of short circuiting molten metal between said electrode and said workpiece;

a fourth stage of, upon generation of an arc across said gap between said electrode and workpiece subsequent to the third stage, maintaining the welding current at a fourth value at a relatively high level exceeding the value of average welding current and controlling the duration of said high level current as a function of the feed rate of said consumable electrode; and

a fifth stage of maintaining the welding current at a fifth value at a relatively low level until said gap between said electrode and workpiece is short-circuited, under control of substantially constant current characteristics so as to feed current of a constant level irrespective of variations in arc length.

4,546,235

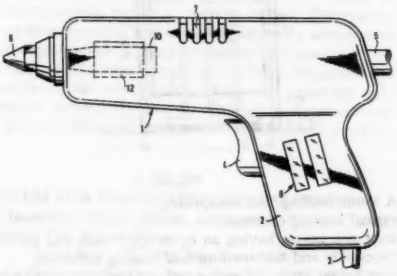
DEVICE FOR MELTING AND DISPENSING A THERMOPLASTIC ADHESIVE

Martin Költer, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed May 3, 1982, Ser. No. 374,528

Int. Cl.⁴ B67D *5/62;* **H05B** *3/42*

U.S. Cl. 219—230 **3 Claims**



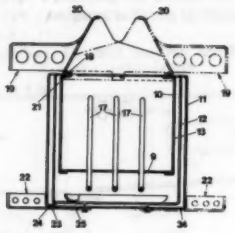
1. Device for melting thermoplastic adhesive and for the measured discharge of the melted adhesive including a housing within which the adhesive is heated and from which it is discharged, said housing having an outwardly extending pistol-like handle, a melting chamber within said housing, a heater element encircling said melting chamber and including at least two controllable heating stages for heating the adhesive including a higher temperature heating stage for use when the device is operating for adequately melting and discharging the melted adhesive and a lower temperature heating stage for heating the thermoplastic adhesive to a temperature so that the higher heating stage quickly raises the temperature of the melted adhesive whereby it is ready for use, wherein the improvement comprises means for supplying power to said device so that said lower temperature heating stage is actuated when power is supplied to said device, a pressure actuated trigger member positioned in said pistol-like handle for supplying a measured amount of adhesive to be heated into said melting chamber and for discharging a measured amount of heated adhesive from said melting chamber, control means located in said handle and operable separately from said trigger member for switching to the higher temperature heating stage when said handle is gripped for carrying out the operation of said pressure actuated trigger member and for switching from the higher temperature heating stage to the lower tempterature heating stage when said handle is released during a temporary interruption in the use of the device, said control means being positioned on the surface of said handle spaced from said trigger member so that said control means are contacted by the hand of the person operating said device when the hand grips said handle in a position ready to operate said trigger member, and said control means includes a delay for delaying the switching from the higher temperature heating stage to the lower temperature heating stage when said control means are released as said handle of the device is released by the person operating said device.

4,546,236

WALL MOUNTING ARRANGEMENT FOR SAUNA HEATING UNITS

Mats O. Janson, Biel-Bienne, Switzerland, assignor to Tylo Sauna S.A., Biel-Bienne, Switzerland

Filed Mar. 25, 1983, Ser. No. 478,855
Claims priority, application Sweden, Apr. 7, 1982, 8202243
Int. Cl.[4] A61H *33/06;* **F24H** *9/06;* **H05B** *1/00*
U.S. Cl. 219—365 **13 Claims**



1. A sauna heating unit comprising:
electrical heating elements;
at least one casing having an open upper side and an open lower side and surrounding said heating elements;
a stone holder arranged within and connected to said casing, said stone holder, said stone holder having oppositely disposed walls;
means to support said electrical heating elements within said casing;
a control panel attached on one side of the heating unit;
control means for electrically connecting and disconnecting said heating elements to and from a source of electric power and for regulating said heating elements, said control means being supported by said control panel;
detachable brackets for mounting the sauna heating unit on a wall; and
means for detachably connecting said brackets to said stone holder at least at the upper side of the heating unit comprising connection members on said oppositely disposed wall of the stone holder for optionally connecting said brackets to the stone holder in at least two positions so that the heating unit can be reversibly mounted on the wall with the control panel in positions substiantially 180° with respect to each other.

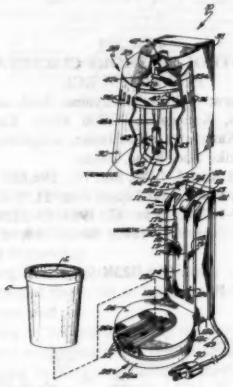
4,546,237

WALL-MOUNTABLE SINGLE CUP ELECTRIC LIQUID HEATING APPLIANCE

Harry F. Collins, Minneapolis, Minn., assignor to Service Ideas, Inc., Minneapolis, Minn.

Filed Nov. 2, 1983, Ser. No. 548,083
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—331 **12 Claims**

1. A single cup heating device for quickly heating a liquid beverage, such as coffee, tea, or the like, contained within a cup, comprising:
an upright, generally straight-walled support having a flat, rear vertical surface and a pair of vertically extending, opposed side surfaces;
a horizontal cup holder affixed to the lower end portion of said support and projecting laterally therefrom for supporting a cup thereon containing a beverage to be heated, said cup holder defining with said upright support a generally L-shaped support pedestal;
a cover having a top wall and a continuous, generally vertical wall depending downwardly therefrom, and cooperating means on said support and said cover mounting said cover for vertical shifting movement relative to said cup holder between a raised position permitting a cup to be place on said cup holder and a lowered position in covering relationship to a cup placed on said cup holder, said downwardly depending wall comprising a skirt-like enclosure with wall means which enclose a cup on said cup holder when said cover is in said lowered position, and said cover further comprising a pair of laterally spaced wall segments projecting outwardly from said skirt-like enclosure towards said upright support in embracing relation to said opposed side surfaces thereof, with the space between said laterally spaced wall segments of said cover being open, whereby said flat, rear vertical surface of said upright support remains uncovered for flat mounting against a wall surface;
a heating element secured to the interior of said cover, said cover when in said raised position being spaced above the



cup supported on said cup holder, and when in said lowered position being positioned over the cup in covering relation therewith so that said heating element projects into the liquid beverage in the cup;
circuit means connected to a source of electrical current including electrical contacts on said support;
electrical contacts on said cover electrically connected with said heating element and movable into engagement with said contacts on said support to energize said heating element and heat the liquid beverage by movement of said cover to its lowered position, and thermally responsive control means on said cover operable when said cover is in the lowered position to de-energize said heating element in response to the temperature of the liquid beverage within the cup reaching a predetermined temperature.

4,546,238

CIRCUIT ARRANGEMENT FOR TEMPERATURE CONTROL OF AN ELECTRIC HEATING ELEMENT

Vilgot Ahs, Koppom, Sweden, assignor to Töcksfors Verkstads AB, Töcksfors, Sweden

Filed Jan. 31, 1983, Ser. No. 462,680
Claims priority, application Sweden, Feb. 8, 1982, 8200711
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **17 Claims**

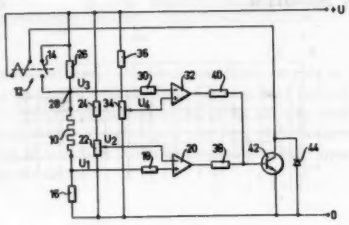
9. A circuit arrangement for controlling the temperature of an electric heating element comprising:
switch means for switching on and off substantially the entire voltage of a voltage supply source across said heating element;
first means for creating a first signal proportional to the current flowing through said heating element;
second means for feeding a quiescent current serving as a test current through said heating element when said switch means is in an off position in order to form a second

signal which is substantially proportional to the voltage across the heating element produced by said test current;

third means for producing a first reference signal independent of the heating element temperature and corresponding to the desired maximum temperature of the heating element;

fourth means for producing a second reference signal independent of the heating element temperature and corresponding to the desired minimum temperature of the heating element;

a first comparator circuit for comparing said first signal with said first reference signal, an output signal being emitted



which switches said switch means to said off position when the first signal is smaller than the first reference signal in order to reduce the heating current through the heating element when a predetermined temperature is attained in said heating element; and

a second comparator circuit for comparing said second signal with said second reference signal, an output signal being emitted which switches said switch means to an on position when the second signal is smaller than the second reference signal in order to increase the current through the heating element when a predetermined lower temperature is attained.

4,546,239

NON-CONTINUOUS SENSING APPARATUS FOR A TEMPERATURE CONTROL

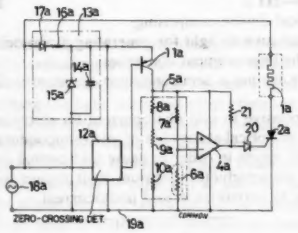
Hideo Sugimori, 12-2, Koaza Shimokubota, Ohaza Hohsono, Seikacho, Sohrakugun, Kyoto-fu, Japan

Filed May 31, 1983, Ser. No. 499,432

Claims priority, application Japan, May 31, 1982, 57-93304; May 31, 1982, 57-93305

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—497 **8 Claims**



1. A non-continuous sensing apparatus for a heater control in which a heater is power-supplied from an A.C. power source through an A.C. power switching element connected in series with said heater, and said A.C. power switching element is operated in accordance with a temperature signal from a temperature sensor, said apparatus comprising:

a D.C. power source for supplying currents necessary to operate said heater control;

a zero-crossing detector for generating a pulse signal each time the instantaneous absolute voltage value of said A.C. power source becomes smaller than a certain definite value;

a D.C. current switching element for switching a current to be supplied to said temperature sensor and a comparator in accordance with said pulse signal generated by said zero-crossing detector;

wherein said comparator compares an output of said temperature sensor with a standard voltage which corresponds to a predetermined control temperature value;

wherein said D.C. current switching element is made conducting by said pulse signal generated by said zero-crossing detector only for a duration of the pulse width of said pulse signal used to cause said D.C. power source to non-continuously supply a current to said temperature sensor so as to enable said sensor to measure a temperature of an object which is being heated by said heater;

and wherein said power switching element is triggered by a triggering pulse which said comparator generates only when the temperature measured by said temperature sensor is lower than said predetermined temperature value.

4,546,240

SYSTEM FOR PERFORMING TRANSACTIONS

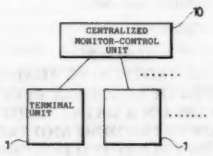
Tutomu Imamichi, Shiga, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 19, 1982, Ser. No. 442,976

Claims priority, application Japan, Nov. 20, 1981, 56-187453

Int. Cl.⁴ G06F *15/30*

U.S. Cl. 235—379 **10 Claims**



1. A system for performing money handling transations comprising:

a plurality of terminal units, each including at least a cash handling device comprising: a plurality of cash containers for respective money denominations, means for circulating cash into and out of said containers, and means for detecting the amount of cash in each of said containers; each of said terminal units including means enabling it to act in one of a cash receiving-delivering transaction mode, a cash receiving-only transaction mode and a cash delivery-only transaction mode; and

means for controlling selection of a transaction mode in which each said terminal unit acts in accordance with the amount of cash contained in the cash handling device of at least one of the other terminal units, said controlling means changing the transaction mode of at least one of said terminal units from a receiving-delivery mode to a receiving-only mode when the amount of cash in at least one of the other terminal units has increased to a predetermined level.

4,546,241

ELECTRONIC PROXIMITY IDENTIFICATION SYSTEM

Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif. 95030

Filed Dec. 10, 1982, Ser. No. 448,516

Int. Cl.⁴ G06K *5/00*

U.S. Cl. 235—380 **8 Claims**

1. An electronic identification system comprising:

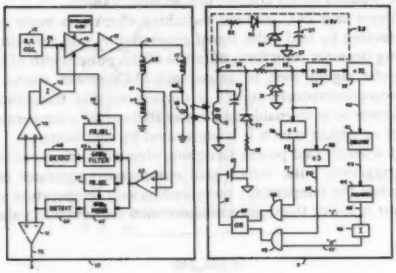
a reader including means to generate, radiate and identify a carrier frequency signal; and

an identification card having an electronic circuit and comprising;

means to receive said carrier frequency signal radiated by said reader;

means to generate power from said carrier frequency signal to energize said card electronic circuit;

a counter to receive and generate secondary radio frequency signals by dividing said carrier frequency signal;



a data memory for recording an identification code identifying said card;

means to access said data memory and select said secondary radio frequency signals responsive to said identification code; and

an antenna connected to receive and radiate said selected secondary radio frequency signals to said reader to allow said reader to identify said card.

4,546,242

METHOD FOR PROTECTING AGAINST THE RE-TRANSFER OF UNIQUELY RECORDED INFORMATION ON A DATA CARRIER AND APPARATUS FOR RECORDING AND/OR READING RE-TRANSFER-PROTECTED INFORMATION

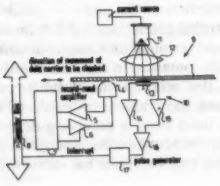
Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Siegfried Bauer, Kussenhofstr. 16, D-7743 Furtwangen, both of Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,504

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038614

Int. Cl.⁴ G06K *19/06*

U.S. Cl. 235—454 **2 Claims**



1. A document with top and bottom sides having a magnetic strip with at least one data storage track, said document having a plurality of holes extending therethrough so that light can pass through the holes from one side of the document to the other side of the document, the holes being in a row substantially parallel to the data storage track, a first set of data bits and a second set of data bits stored in said data storage track, said second set of data bits representing a relationship between bits of said first set of data bits and the geometric position of the holes.

4,546,243

ELONGATED LIGHT RECEIVING ELEMENT ASSEMBLY

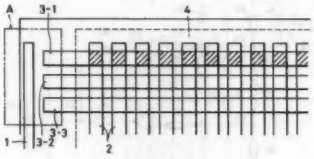
Toshihisa Hamano; Takeshi Nakamura, and Hisao Ito, all of Kanagawa, Japan, assignors to Fuji Xerox Company, Limited, Japan

Filed Jun. 17, 1982, Ser. No. 389,357

Claims priority, application Japan, Jun. 23, 1981, 56-95923

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 R **6 Claims**



1. An elongated light receiving element assembly comprising; a substrate, first electrodes arranged in parallel in a first direction, a photo-conductor, and second electrodes arranged in parallel in a substantially perpendicular direction and confronting said first electrodes, such that light receiving elements are formed at the intersections of said first and second electrodes,

a member of high electrical conductivity arranged in parallel with a portion of each of said second electrodes, to improve the electrical conductivity of said second electrodes,

a power supply electrode disposed adjacent said first electrodes, and connected to a selected one of said second electrodes,

said assembly further including means for bit compensation comprising said second electrodes arranged in a plurality of parallel rows confronting said first electrodes.

4,546,244

NONLINEAR AND BISTABLE OPTICAL DEVICE

David A. B. Miller, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 14, 1984, Ser. No. 589,556

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 J **26 Claims**

1. An optical device comprising:

means responsive to light for generating a photocurrent;

wherein the improvement comprises;

a structure having a semiconductor quantum well region; and

means responsive to said photocurrent for electrically controlling an optical absorption of said semiconductor quantum well region in order to cause said optical absorption of said semiconductor quantum well region to vary in response to variations in said photocurrent.

4,546,245

ELECTRONIC CONTROLLER

Ellis Cooper, and Gerald Lindahl, both of New York, N.Y., assignors to Joseph A. Barbosa, New York, N.Y.

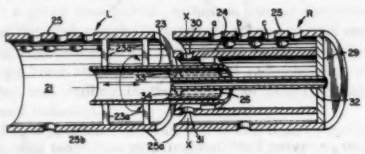
Continuation-in-part of Ser. No. 95,622, Nov. 19, 1979, abandoned. This application May 17, 1983, Ser. No. 495,165

Int. Cl.⁴ H01J *40/14*

U.S. Cl. 250—211 K **4 Claims**

1. In an electronic controller utilizing photovariable resistance, and outer cylinder provided with a first light source and

first photoresistor and a second light source and second photoresistor, said photoresistors and light sources spaced and opposed within said outer cylinder, a variable density filter comprises a portion of a concentric inner cylinder, a first semi-cylinder of said filter varying in intensity along its circumference and movable between said first light source and first photoresistor, the second semi-cylinder of said filter varying in intensity along its length and movable between said second light source and second photoresistor, whereby rotating said filter varies the intensity of light upon said first photoresistor, and telescoping of said filter varies the intensity of light upon said second photoresistor.



4,546,246

LIGHT BARRIER WITH SPECTRALLY FILTERED REFLECTION MEANS

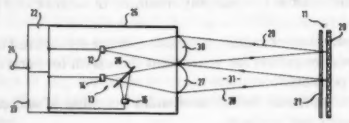
Klaus Bechtel, Worms, Fed. Rep. of Germany, assignor to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,279

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3237035

Int. Cl.⁴ G08B *13/18*; G06M *7/00*

U.S. Cl. 250—221 **10 Claims**



1. A reflection light barrier for recognising articles, including strongly reflecting articles, within a monitored region through which a light beam passes, wherein a light transmitter for transmitting the light beam and a light receiver including a photoelectric converter are arranged at one location, wherein a reflecting device on which the light beam falls and which changes the state of the transmitted light beam and reflects it directly to the receiver is arranged at another location, and wherein an electronic processing circuit is connected to the light receiver, with said electronic processing circuit transmitting a signal on interruption of the monitored region and on the incidence of light reflected onto the light receiver from an article located in the monitored region, characterised in that the reflecting device (11) has optical filter characteristics in such a way that the spectral distribution of the light reflected thereby is changed; and in that the processing circuit only transmits said signal following incidence of light on the light receiver when the spectral distribution of this light does not correspond to the spectral distribution of the light reflected from the reflecting device.

4,546,247

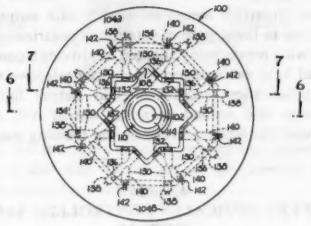
CHIPPED NECK INSPECTOR

John J. Peyton, and Bryan K. Watt, both of Santa Barbara, Calif., assignors to Industrial Automation Corp., Goleta, Calif.

Continuation of Ser. No. 319,062, Nov. 6, 1984,. This application Oct. 1, 1984, Ser. No. 656,492

Int. Cl.⁴ G01V *9/04*

U.S. Cl. 250—223 B **12 Claims**



1. A system for detecting the condition of the lip of a container comprising:

at least one stationary source of pulsed energy;

guide means for guiding said energy from said at least one source of pulsed energy to form a plurality of beams of energy directed toward and distributed around the lip of said container, each of said beams directing energy toward an area of the lip of such container substantially unique to that beam;

a plurality of stationary sensor means equal in number to said plurality of beams of energy, each for generating an electrical signal responsive to the amount of energy reflected by said lip and incident to said respective sensor means, said guide means further being a means to substantially limit the energy incident to each said sensor means to that originating from an associated one of said plurality of beams of energy and reflected by the respective area of the lip of said container unique thereto; and

output means coupled to said plurality of sensor means and simultaneously responsive to said electrical signals therefrom to provide an output signal indicative of the condition of the lip of said container.

4,546,248

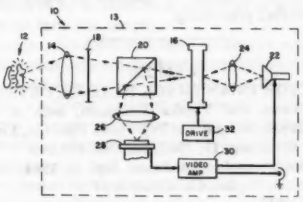
WIDE DYNAMIC RANGE VIDEO CAMERA

Glenn D. Craig, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 8, 1983, Ser. No. 530,185

Int. Cl.⁴ G02F *1/01*

U.S. Cl. 250—225 **13 Claims**



1. A wide dynamic range video system for significantly attenuating bright areas in the image of a scene comprising:

a liquid crystal light valve means adapted to receive a linearly polarized input light pattern and therefrom produce

a linearly polarized output light pattern and having control means adapted to variably and selectively rotate the polarization vectors of light in said output light pattern;

a first lens means for collecting light from a viewing scene and focusing the same on said light valve means as an input light;

a first polarizer means adapted to linearly polarize said input light;

a viewing means for viewing the output light from said light valve means;

a second polarizer means to modify said output light in response to the degree of rotation of polarization vectors;

said viewing means being adapted to provide a control signal to said light valve means for causing selective rotation of the polarization vectors of said output light pattern whereby said second polarizer means will selectively attenuate the light received by the viewing means.

4,546,249

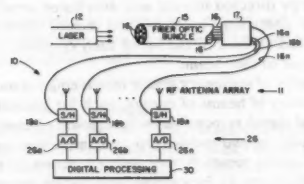
HIGH SPEED OPTICALLY CONTROLLED SAMPLING SYSTEM

Harper J. Whitehouse, and William H. McKnight, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1983, Ser. No. 510,016

Int. Cl.[4] G02B *5/14*

U.S. Cl. 250—227 **14 Claims**



1. An apparatus for enabling the high speed synchronous sampling of signals from a plurality of signal sources comprising:

means for providing light pulses at a rate equal to the high speed sampling;

means disposed to receive the light pulses from the providing means for optically creating a series of actuating light pulses, each delayed in sequence from one another and each series starting from each light pulse from the providing means; and

means operatively associated with the actuating light pulse creating means and connected to the signal sources for sampling each of the signal sources at the sampling rate and in the same synchronous sequence as the series of actuating pulses; and

means coupled to the sampling means for converting the synchronous sequence of samples to digital signals to allow further processing.

4,546,250

DETECTOR IN AN IMAGE READ-OUT SYSTEM

Kazuo Horikawa, and Yutaka Taniguchi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

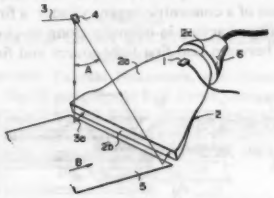
Filed Sep. 17, 1982, Ser. No. 419,199

Claims priority, application Japan, Sep. 18, 1981, 56-147070

Int. Cl.[4] G02B *5/14*

U.S. Cl. 250—227 **6 Claims**

1. A detector comprising a light guiding sheet having a linear light detecting face disposed at one end extending along a scanning line of an image-bearing sheet and an annular light output face disposed at the other end, and a photo-electric convertor connected to said annular light output face, characterized in that said light guiding sheet is provided with a photo-



sensor for receiving light incident from said linear light detecting face which propagates through said light guiding sheet.

4,546,251

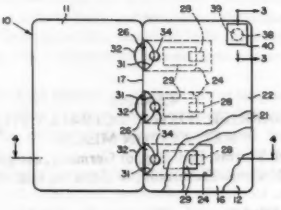
DEVICE FOR MONITORING X-RAY RADIATION AND METHOD OF USING SAME

Derace L. Schaffer, 148 Oak La., Rochester, N.Y. 14610

Continuation-in-part of Ser. No. 523,095, Aug. 15, 1983,. This application Mar. 12, 1984, Ser. No. 588,368

Int. Cl.[4] G01D *18/00*

U.S. Cl. 250—252.1 **20 Claims**



1. A device for measuring cumulative and selective ionizing radiation dosages, such as X-ray radiation dosages, comprising

a portable, generally wallet-sized carrier having therein a plurality of spaced, similarly-shaped pockets,

a support member removably mounted in each of said pockets,

a first plurality of radiation sensitive elements secured to said support members for movement therewith into and out of said pockets,

a further radiation sensitive element mounted in said carrier adjacent said pockets,

cooperating retaining means on said carrier and on said support members, respectively, and operative releasably to secure said members from accidental movement from said pockets, and

means fixing said further radiation sensitive element in said carrier to prevent removal of said further element except by destroying said carrier in the vicinity of said further element.

4,546,252

METHOD FOR MONITORING POTASSIUM CHLORIDE CONCENTRATION IN DRILLING FLUIDS

Eric P. Dion, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 25, 1984, Ser. No. 634,090

Int. Cl.[4] G01V *5/00*

U.S. Cl. 250—252.1 **7 Claims**

1. A method for monitoring the potassium chloride concentration in a drilling fluid during well drilling operations, comprising the steps of:

(a) selecting a container for holding a drilling fluid,

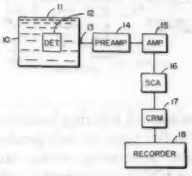
(b) centrally locating a gamma radiation detector within said container,

(c) filling said container with drilling fluid containing no measurable potassium chloride content in an amount that is self-shielding with respect to background radiation external to said container,

(d) recording the gamma radiation measured by said detector over a given time period within an energy band centered about the peak gamma radiation of potassium, said radiation being representative of background radiation within said energy band attributable to natural radioelements present within said drilling fluid exclusive of said external background radiation,

(e) adding a potassium chloride salt to said fluid to increase the potassium chloride concentration of said fluid to a predetermined concentration percentage,

(f) recording the gamma radiation measured by said detector over said given time period within said energy band for said potassium chloride containing fluid,



(g) repeating steps (e) and (f) for a plurality of potassium chloride concentration percentages,

(h) subtracting said drilling fluid background radiation from each of said plurality of potassium chloride gamma radiation measurements to obtain a net potassium count rate for each of said plurality of measurements,

(i) plotting potassium count rates against the corresponding potassium chloride concentrations attributing to said count rates to obtain a calibration curve for use in identifying the potassium chloride concentration of an unknown sample of a drilling fluid when measured with the specific combination of said detector and said container,

(j) filling said container with drilling fluid taken as it is being circulated through a well during a drilling operation, and

(k) measuring the gamma radiation count rates of said drilling fluid and utilizing said calibration curve to provide an indication of any depletion in the potassium chloride concentration of said drilling fluid as said well drilling operation continues.

4,546,253

APPARATUS FOR PRODUCING SAMPLE IONS

Masahiko Tsuchiya, 4-37-27, Kugayama, Suginamiku, Tokyo, 186, Japan, and Hirofumi Kuwabara, Tokyo, Japan, assignors to Masahiko Tsuchiya, Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 517,966

Claims priority, application Japan, Aug. 20, 1982, 57-143254

Int. Cl.[4] B01D *44/00*

U.S. Cl. 250—288 **8 Claims**

1. An apparatus for producing sample ions from a specimen comprising:

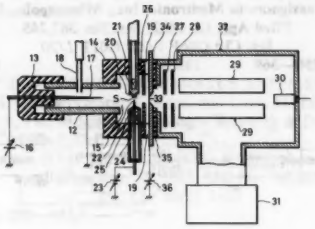
(a) means for supporting the specimen;

(b) a needle-shaped emitter, the pointed end of which is arranged adjacent the specimen;

(c) means for applying a high potential to the emitter;

(d) means for producing a metastable but nonionized species by corona discharge in a carrier gas; and

(e) means for directing the carrier gas with the metastable species to the specimen



whereby the specimen, on contact with the metastable species, together with the emitter at high potential, produces a large quantity of sample ions.

4,546,254

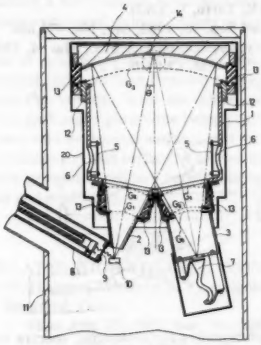
CHARGED PARTICLE ENERGY ANALYZER

Hiroshi Yamauchi, Uji, Japan, assignor to Shimadzu Corporation, Kyoto, Japan

Filed Mar. 24, 1983, Ser. No. 478,348

Int. Cl.[4] H01J *49/48*

U.S. Cl. 250—305 **9 Claims**



1. A charged particle energy analyzer comprising:

source means for generating radiation and directing said radiation to be incident on a sample so as to emit charged particles from the sample;

low energy pass reflection filter means for selectively reflecting charged particles having energy lower than a first value, said low energy pass reflection filter means comprising a reflector and first grid means,

high energy pass transmission filter means for selectively transmitting charged particles having energy higher than a second value; and

detector means for detecting said charged particles;

wherein said reflector of said low energy pass reflection filter means has two complex focuses symmetrically disposed with respect to the center of said reflector; and

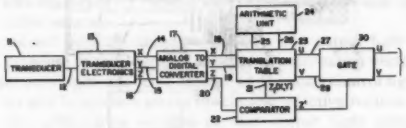
said sample is positioned at one of said focuses and said detector is positioned at the other of said focuses.

4,546,255

ENERGY WINDOW SELECTION FOR A RADIATION SIGNAL PROCESSING SYSTEM

Glenn F. Knoll, and Mark E. Schrader, both of Ann Arbor, Mich., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 12, 1982, Ser. No. 367,245
Int. Cl.[4] G06F 7/38; G01T 1/20
U.S. Cl. 250—369 17 Claims



1. A signal processing system for radiation imaging apparatus comprising:

(a) detector means capable of producing an output signal representing apparent orthogonal spatial coordinates and the associated energy level of a radiation event;

(b) means for determining the energy level distribution of radiation events occurring within predetermined elements in response to an image of known energy level, each of said elements defining a predetermined portion of the apparent image field; and

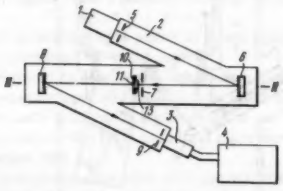
(c) means for causing each element to accept substantially the same number of events in response to said image.

4,546,256

SPECTROPHOTOMETER FOR MEASURING TRANSMISSION SPECTRA

Roman A. Denisov; Valdur M. Tiit, and Eduard K. Feldbakh, all of Tartu, U.S.S.R., assignors to Institut Fiziki Akademii Nauk Estonskoi SSR, Tartu, U,S.S.R.

Filed Sep. 23, 1982, Ser. No. 421,804
Claims priority, application U.S.S.R., Mar. 4, 1982, 3404546
Int. Cl.[4] G01J 3/42
U.S. Cl. 250—372 12 Claims



1. A spectrophotometer for measuring spectra in a spectral range of wavelengths from 100 to 300 nm and an extended transmission measuring range to 10^{-7}% of the incident light intensity, comprising:

a light source for generation of a light flux;

a double monochromator consisting essentially of an input slit, a first dispersive element, an intermediate slit, a second dispersive element, and an output slit, all arranged in series along the propagation path of said light flux;

a holder for a test sample disposed in said monochromator between said intermediate slit and said second dispersive element and capable of moving across the propagation path of said light flux that passed through said intermediate slit;

means for providing said movement of said holder between a first position for placing said sample across the propagation path of said light flux and a second position for removing said sample from the path of said light flux so that the test sample is only across said propagation path in said first position;

a light detector positioned in the path of said light flux after said monochromator and having an output; and

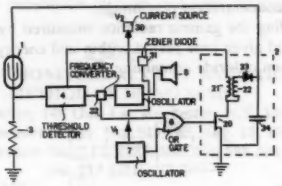
a recording means having an input connected to said output of said light detector.

4,546,257

DEVICES FOR MEASURING IONIZING RADIATIONS

Jacques Lewiner, 5 rue Bory d'Arnex, 92210 Saint Cloud; Didier Perino, 10 rue de Bellevue, 92150 Suresnes, and Claude Hennion, 18 rue Flatters, 75005 Paris, all of France

Filed Oct. 19, 1983, Ser. No. 543,320
Claims priority, application France, Oct. 19, 1982, 82 17498
Int. Cl.[4] G01T 1/18
U.S. Cl. 250—388 7 Claims



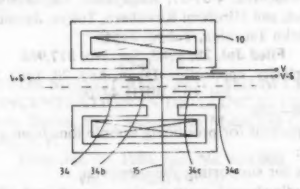
1. A device for measuring ionizing radiations, comprising a tube of the Geiger-Muller type, an independent source of DC electric current, pulse generating means connected to said source for generating high voltage pulses, rectifier means for transforming said pulses into a high DC voltage for supplying the Geiger-Muller tube, and means connected to said Geiger-Muller tube for detecting when the ionizing radiation intensity applied to said tube exceeds a predetermined threshold and for activating an alarm circuit to produce an alarm signal when said threshold is exceeded, said pulse generating means comprising a pulse generator supplied with a DC voltage V_1 and comprising inverters of the CMOS type, and a converter, supplied with a DC voltage V_2 greater than V_1, for amplifying the pulses from the pulse generator, the voltages V_1 and V_2 both being derived from said source, and said pulse generating means generating pulses at a first, relatively low repetition frequency when the ionizing radiation is below said threshold and generating pulses at a repetition frequency related to the output of the Geiger-Muller tube when the ionizing radiation exceeds said threshold.

4,546,258

CHARGED PARTICLE BEAM APPARATUS

Thomas Chisholm, Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1983, Ser. No. 466,289
Claims priority, application United Kingdom, Feb. 26, 1982, 8205652
Int. Cl.[4] H01J 3/14
U.S. Cl. 250—396 R 18 Claims



1. A charged particle beam apparatus comprising:

means for generating a beam of charged particles;

a lens system including a magnetic lens for focussing said beam and an electric lens arranged in parallel with the magnetic

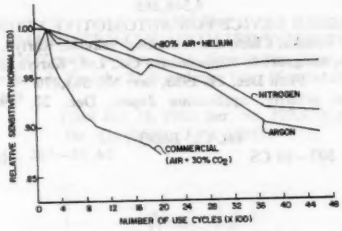
lens, the strength of said electric lens being subject to variation independently of said magnetic lens by variation of electrical potentials applied to said electric lens without causing the beam to rotate, fine focussing of said beam being facilitated by said strength variation of said electric lens.

4,546,259

THERMOLUMINESCENCE DOSIMETER

Robert Zendle, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1983, Ser. No. 548,278
Int. Cl.[4] G01T 1/11
U.S. Cl. 250—484.1 4 Claims



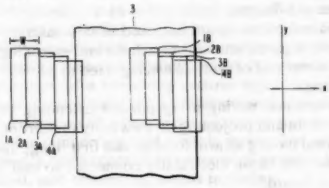
1. A thermoluminescence dosimeter comprising:
a detector crystal;
a glass enclosure in which said detector crystal is located, said glass enclosure being air tight; and
a fill gas contained in said glass enclosure, said fill gas being 5 to 25 mole percent helium admixed with a gas selected from the group consisting of air, nitrogen and argon, said fill gas further being substantially non-reactive with said detector crystal when said detector crystal is heated to thermoluminescence.

4,546,260

ALIGNMENT TECHNIQUE

Robert A. Simpson, Wappingers Falls; Ralph R. Trotter, Hopewell Junction, and Edward V. Weber, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,515
Int. Cl.[4] H01J 37/00
U.S. Cl. 250—491.1 11 Claims



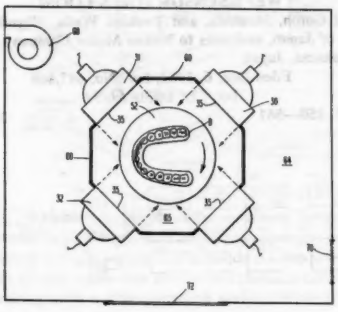
1. A system of aligning a scanning beam to a pattern comprising:
sensor means for generating signals during scans of separate portions of a pattern;
processing means receiving said signals and producing a position correction increment signal having a sign and a magnitude indicative of the direction and the amount of misposition of said beam relative to said separate portions of said pattern; and
means receiving said position correction increment signal and combining it with the correction which was applied during said scans to produce a correction signal having a magnitude indicative of the amount of required beam correction and a sign indicative of the required direction of correction.

4,546,261

DENTURE CURING APPARATUS AND METHOD

Donald I. Gonser; George T. Eden, and Louis H. Tateosian, all of York, Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Continuation of Ser. No. 492,284, May 6, 1983, abandoned. This application Feb. 27, 1985, Ser. No. 705,865
Int. Cl.[4] G01J 1/00
U.S. Cl. 250—492.1 22 Claims



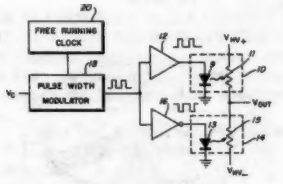
1. Visible light denture curing apparatus, comprising support means defining a substantially horizontal surface for supporting a denture composed at least in part of light curable material;
an array of collimated light sources positioned to direct collimated light on said denture at an angle of 20°–45° toward the vertical from the plane of said horizontal surface, each said light source being positioned about 5–13 cm from said horizontal surface, said sources providing a power density at said surface of at least about 50 mw/cm^2;
means for providing relative rotation between said support means and said array.

4,546,262

ISOLATED HIGH VOLTAGE CONTROLLER

Raymond W. Huggins, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1983, Ser. No. 508,389
Int. Cl.[4] G02B 27/00
U.S. Cl. 250—551 7 Claims



1. A high voltage controller comprising
a first and a second light source,
a buffer connected to the first light source,
an inverting buffer connected to the second light source,
a pulse width modulator, the output of the pulse width modulator connected to the buffer and inverting buffer,

a first light dependent resistor optically coupled to the first light source,

a second light dependent resistor optically coupled to the second light source, the light dependent resistors having a common connection,

a load circuit connected to the common connection of the light dependent resistors,

a differential amplifier providing an input circuit to the pulse width modulator, and

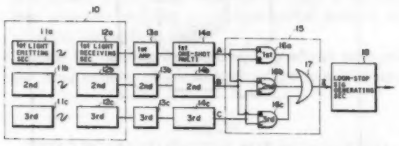
a feedback circuit interconnecting the common connection of the light dependent resistors, each of the light dependent resistors connected to a high voltage source, and the differential amplifier whereby a constant output impedance high voltage controller is provided.

4,546,263

WEFT SENSOR FOR A LOOM

Miyuki Gotoh, Machida, and Yoshimi Wada, Higashiyamato, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 6, 1982, Ser. No. 447,468
Int. Cl.⁴ D03D *51/34*
U.S. Cl. 250—561 **12 Claims**



1. A weft sensor for a loom for detecting presence or absence of a weft inserted into a warp shed, which comprises:

(a) plural weft-detection means for detecting the presence or absence of the weft inserted into the warp shed and for outputting plural weft-presence detection signals independently when a weft is present in the warp shed;

(b) plural AND gates each connected to at least half of said plural weft-detection means for outputting a logical AND product signal, respectively, of each possible combination of at least half of the number of the weft-presence detection signals; and

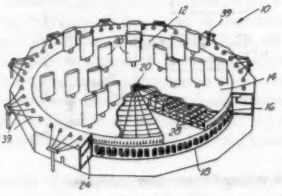
(c) an OR gate connected to said plural AND gates for outputting a logical OR sum signal of all of the logical AND product signals.

4,546,264

RELATING CELLULAR ENERGY GENERATING AND STORAGE DEVICE

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 24, 1983, Ser. No. 544,587
Int. Cl.⁴ H02P *9/04*
U.S. Cl. 290—54 **8 Claims**



1. A rotating cellular energy generating device for generating electrical power for extended periods of time, the device comprising:

an annular rotating housing having sides, a bottom and a top;

a containment surrounding the sides and the bottom of the rotating housing;

a plurality of individual compartments in the housing for holding movable material therein;

auxillary power means for initially rotating the housing to a pre-determined speed and periodically maintaining the pre-determined speed as the need is required;

means for redistributing the material in the compartments as energy is used and as the energy is developed;

armature windings mounted around the periphery of the housing; and

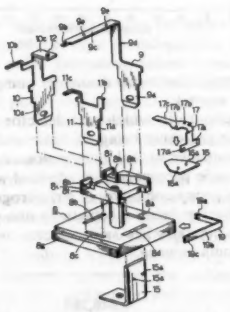
field windings mounted in the containment and adjacent the armature windings.

4,546,265

FLASHER DEVICE FOR AUTOMOTIVE VEHICLE

Ryoichi Tanaka, Chita, and Yasuhiko Sakurai, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 21, 1983, Ser. No. 563,870
Claims priority, application Japan, Dec. 22, 1982, 57-198363[U]
Int. Cl.⁴ B60Q *1/38*
U.S. Cl. 307—10 CS **10 Claims**



1. A flasher device for an automotive vehicle comprising:

a casing;

a spool made of synthetic resin and having a first flange and a second flange closing an open end of said casing;

first to fourth slits formed in said second flange;

a central bore formed in said spool;

an iron core inserted into said central bore;

a relay coil wound on said spool and between said first and second flanges;

a printed circuit board enclosed in said casing;

a yoke inserted into said fourth slit and extending upwardly, a lower end of said yoke being fixed to a lower end of said core;

a B-terminal having a leg portion extending through said first slit and projecting downwardly therefrom, said B-terminal having an arm fixed to said first flange and an end of said arm being electrically connected to said printed circuit board;

an L-terminal having a leg portion extending through said second slit and projecting downwardly therefrom, said L-terminal having an arm on which a fixed contact is attached, said L-terminal further having a tongue portion electrically connected to said printed circuit board;

an E-terminal having a leg portion extending through said third slit and projecting downwardly therefrom, said E-terminal having a pair of forked ends, one of which is electrically connected to said printed circuit board and the other of which is connected to one end of said relay coil, the other end of said relay coil being connected to said printed circuit board;

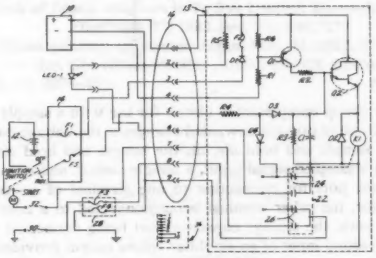
a leaf spring fixed to said yoke;
an armature fixed to said leaf spring and placed above a top end of said iron core so that said armature is attracted to said iron core by an electromagnetic force produced by said relay coil;
a movable contact fixed to a forward end of said leaf spring;
said movable contact being positioned above said fixed contact so that when said armature is attracted to said iron core said movable contact becomes in contact with said fixed contact;
a resistor element connected at its one end to said B-terminal, at its middle portion to said yoke and at its other end to said printed circuit board, so that a main lamp current flows from said B-terminal to said L-terminal through said resistor element, said movable contact and said fixed contact.

4,546,266

MAGNETICALLY ACTUATED INTERLOCK

Walter N. Zenick, 144 South Rd., Farmington, Conn. 06032, and Richard J. Zenick, 27 Boardman Ter., Weathersfield, Conn. 06109

Filed Jul. 28, 1983, Ser. No. 517,972
Int. Cl.[4] B60R *25/04;* **H01H** *47/32*
U.S. Cl. 307—10 AT **18 Claims**



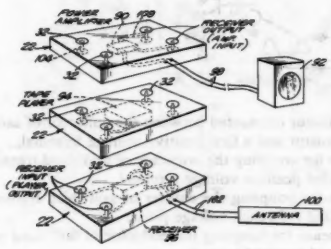
1. Apparatus for controlling the state of an electrical circuit comprising:
magnetic field responsive sensor means, said sensor means providing an output signal when subjected to a magnetic field of the appropriate strength and polarity;
normally de-energized switch means, said switch means having a control input and at least first and second normally open contacts, said switch means being responsive to the application to the control input thereof of a switching control signal, energization of said switch means establishing a path for the flow of electrical current between said first and second normally open contacts;
means responsive to an output signal provided by said sensor means for generating a switching control signal for energization of said switch means, said switching control signal generating means including means for maintaining the application of a switching control signal to said switch means control input for a predetermined time subsequent to termination of a sensor means output signal;
means for connecting said switch means first and second normally open contacts in series with a circuit to be controlled, said connecting means including:
a first multi-conductor electrical cable, at least two of the conductors of said cable being connected at first ends thereof to respective of said switch means first and second contacts;
a second multi-conductor cable, at least two of the conductors of said second cable being connected at first ends thereof to the circuit to be controlled; and
plug means for joining said first and second cable means, said plug means having a pair of separable portions connected to the second ends of the conductors of respective of said cables; and
by-pass means, said by-pass means being complementary to and receivable in the said plug means portion associated with said second of said multi-conductor cable means, said by-pass means being employed to establish an electrical connection between the said at least two conductors when said plug means portions have been separated.

4,546,267

MODULAR EQUIPMENT CONNECTION

Steven Urfirer, 77 Main St., Lake Placid, N.Y. 12946

Filed Jan. 11, 1984, Ser. No. 569,821
Int. Cl.[4] H01H *35/00;* **H05K** *5/00*
U.S. Cl. 307—116 **8 Claims**



1. A modular electronic interconnection system for the interconnection of a group of electrical apparatus constructed as separate circuits enclosed in individual cases wherein:
each of said cases has an exterior surface configured for mating with a corresponding surface of another of said cases;
each of said cases comprises a set of electrical contact pads disposed in a predetermined arrangement on said exterior surface, each contact pad being associated with a specific function of the circuit enclosed within the case;
electrical connection between the apparatus being made by placing cases of the apparatus contiguous to each other with a mating of corresponding ones of said exterior surfaces and a contacting of corresponding ones of said contact pads on each of said cases, the same predetermined arrangement of the contact pads being present in a plurality of said cases to permit interconnection of corresponding contact pads upon a mating of said exterior surfaces; said system further comprising:
interlock means in each of said cases automatically operable upon said electrical connection being made between the apparatus for then connecting individual ones of said contact pads in individual ones of said cases with terminals of the circuits contained in said cases to permit the flow of electric signals between circuits of the apparatus.

4,546,268

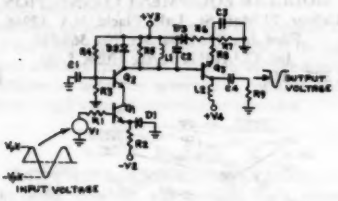
NARROW PULSEWIDTH PULSE GENERATOR CIRCUIT UTILIZING NPN MICROWAVE TRANSISTORS

Stephen P. Caldwell, Linthicum, and David R. Pedersen, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,561
Int. Cl.[4] H03K *5/07*
U.S. Cl. 307—265 **7 Claims**

1. A pulse generator circuit comprising:
a signal input terminal,
a signal output terminal,
first, second and third NPN transistors each having a base, an emitter and a collector,
means for coupling the base of said first transistor to said input terminal,

means for coupling the emitter of said first transistor to a negative voltage terminal,
means for coupling the collector of said first transistor to the emitter of said second transistor,
means for coupling the base of said second transistor to a first reference voltage point,
said second transistor having its collector coupled to the base of said third transistor,



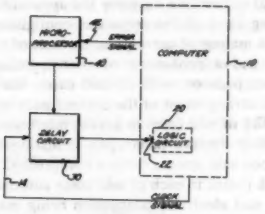
an inductor connected between the collector of said second transistor and a first positive voltage terminal,
means for coupling the collector of said third transistor to a second positive voltage terminal,
means for coupling the emitter of said third transistor to a second reference voltage point,
and means for coupling the collector of said third transistor to said output terminal.

4,546,269

METHOD AND APPARATUS FOR OPTIMALLY TUNING CLOCK SIGNALS FOR DIGITAL COMPUTERS

Gerald H. Johnson, White Bear Lake, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Dec. 1, 1983, Ser. No. 557,024
Int. Cl.[4] H03K *5/13*
U.S. Cl. 307—269 **16 Claims**



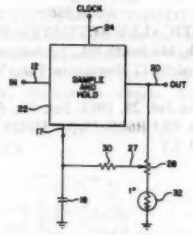
1. In a computer having a clock source for generating a clock signal and a logic circuit having a clock input, a method for determining an optimal clocking point for the arrival of said clock signal at said clock input, comprising the steps of:
(a) inputting said clock signal into a means for delaying said clock signal a variable period of time between an earliest clocking point wherein the clock signal is delayed for a minimum period of time, and a latest clocking point wherein said clock signal is delayed for a maximum period of time, said delay means being controlled by a controlling means;
(b) setting said delay means to an initial clocking point between said earliest clocking point and said latest clocking point;
(c) varying said delay means during a first search mode to cause such clock signal to arrive at said clock input later and later in time with respect to said initial clocking point until said logic circuit fails so as to indicate a late clocking failure limit;
(d) varying said delay means during a second search mode to cause said clock signal to arrive at said clock input earlier and earlier in time with respect to said initial clocking point until said logic circuit fails, so as to indicate an early clocking failure limit;
(e) determining an optimal clocking point between said early clocking failure limit and said late clocking failure limit;
(f) setting said delay means to said optimal clocking point for the normal operating mode of the computer.

4,546,270

SAMPLE AND HOLD DROOP COMPENSATION CIRCUIT

Richard C. Cabot, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 29, 1983, Ser. No. 537,468
Int. Cl.[4] G11C *27/02*
U.S. Cl. 307—353 **9 Claims**



1. A droop compensation circuit for use with a sample and hold circuit to prevent unwanted changes in the voltage output of the sample and hold circuit, the sample and hold circuit having a sampled signal input, a sample output, and a storage capacitor port for connection to one terminal of a storage capacitor, the other terminal being connected to a common return path, the storage capacitor port being connected to a non-inverting input of an amplifier whose output provides the sample output, said droop compensation circuit comprising:
(a) first resistor means connected to said sample output for providing a selected resistance therethrough between said sample output and a first node;
(b) second resistor means connected between said storage capacitor port and said first node for providing a selected resistance therethrough; and
(c) temperature compensation means, connected to said first resistor means, for varying the current through said first resistor means between said sample output and said first node with changes in ambient temperature, thereby varying the current flow through said second resistor means.

4,546,271

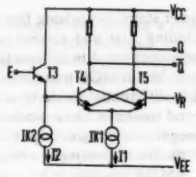
INTEGRATED LOGIC ELEMENT IN E^2CL TECHNOLOGY

Claude Barre, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,314
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1982, 3230591
Int. Cl.[4] H03K *19/086, 19/003, 17/60*
U.S. Cl. 307—443 **2 Claims**

2. In an integrated logic element of the type having a differential amplifier comprising first and second transistors each including a base, a collector and an emitter, in which the two emitters are connected together and fed by a first constant current source, the collectors are connected to a voltage source by way of respective load resistors and respective output taps connected to the collectors of the first and second transistors, in which the base of the first transistor is connected to a reference potential, and in which a third transistor include a collector connected to the voltage source, an emitter fed by

a second constant current source and connected to the base of the second transistor, and a base serving as an input for receiving logic signals, the improvement therein comprising:



a first additional emitter included in the first transistor and connected to the collector of the second transistor; and

a second additional emitter included in the second transistor and connected to the collector of the first transistor.

4,546,272

ECL CIRCUIT FOR FORCIBLY SETTING A HIGH LEVEL OUTPUT

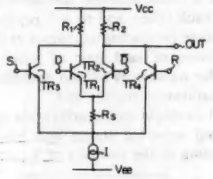
Hirokazu Suzuki, Yamato, and Masayuki Kokado, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,727

Claims priority, application Japan, May 31, 1982, 57-091375

Int. Cl.⁴ H03K *19/086, 19/092, 19/003, 17/06*

U.S. Cl. 307—455 **5 Claims**



1. An emitter coupled logic circuit operatively connected to receive complementary signals and a set signal, and having an output terminal, comprising:

a differential pair of transistors having emitters commonly connected, having bases for receiving the complementary signals, and having collectors;

an impedance element operatively connected to the commonly connected emitters of said differential pair of transistors;

a constant current source operatively connected to said impedance element; and

a set transistor having an emitter operatively connected to said constant current source, having a base for receiving the set signal and having a collector operatively connected to the collector of one of said differential pair of transistors, the output terminal being operatively connected to the collector of one of the transistors forming said differential pair of transistors, for providing an output from said differential pair of transistors.

4,546,273

DYNAMIC RE-PROGRAMMABLE PLA

Fazil I. Osman, San Marcos, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 11, 1983, Ser. No. 457,176

Int. Cl.⁴ H03K *19/177, 19/094, 19/003;* **H04Q** *3/00*

U.S. Cl. 307—468 **11 Claims**

1. A programmable logic array having and AND array disposed for receiving n input signals, an OR array providing k output signals on k output lines, and m term lines and m bit lines coupling said AND and OR arrays, wherein n, m, and k are integers greater than one, said array comprising:

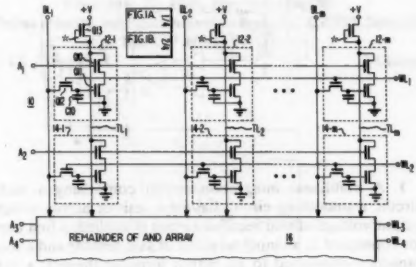
a. AND array having n×m cells wherein each cell comprises:

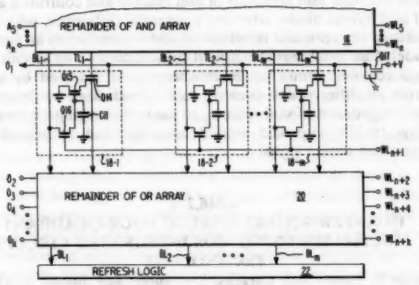
(i) first and second transistor means coupled in series between one of said term lines and a reference potential, each of said transistor means having a control element;

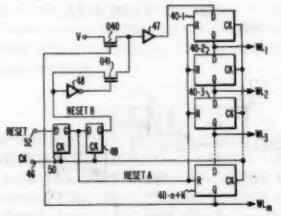
(ii) a first charge storage element coupled to the control element of said first transistor means;

(iii) one of said n input terminals being coupled to the control element of said second transistor means;

b. OR array having m×k cells wherein each cell comprises:







(i) third and fourth transistor means coupled in series between one of said output lines and a reference potential, each of said transistor means having a control element;

(ii) a second charge storage element coupled to the control element of said third transistor means;

(iii) one of said m term lines being coupled to the control element of said fourth transistor means;

c. refresh logic means coupled between said bit lines and said first and second charge storage elements; and

d. said refresh logic means including word lines which operate to selectively couple charge from said bit lines onto said charge storage elements.

4,546,274

NON-LINEAR INTEGRATION CIRCUIT

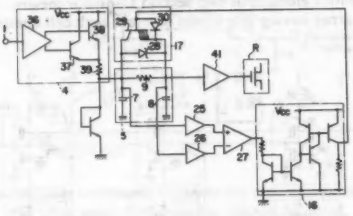
Koichi Sakai, Tokyo, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,463

Claims priority, application Japan, Apr. 15, 1982, 57-54675[U]

Int. Cl.⁴ H03K *5/22, 3/313;* **G06G** *5/18*

U.S. Cl. 307—494 **7 Claims**



1. A non-linear integration circuit comprising a rectifier circuit; a smoothing circuit having a resistor across which an output voltage of said rectifier circuit is applied, a first capacitor connected to an input terminal of said resistor and a second capacitor connected to an output terminal thereof; a hybrid diode for varying an impedance between said terminals of said resistor; and an error amplifier which detects a potential difference between said terminals of said resistor and controls a gain of said hybrid diode; whereby a potential difference, which is induced between said terminals of said resistor when an amplitude of an input signal supplied to said smoothing circuit by said rectifier circuit increases abruptly, is detected by said error amplifier which controls said hybrid diode to decrease said impedance of said resistor, to cause a charging current to flow rapidly into said second capacitor and to provide a smoothed output signal.

4,546,275

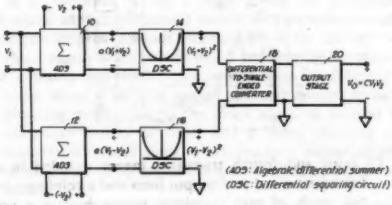
QUARTER-SQUARE ANALOG FOUR-QUADRANT MULTIPLIER USING MOS INTEGRATED CIRCUIT TECHNOLOGY

Jesus S. Pena-Finol, Caracas, Venezuela, and Joseph A. Connelly, Marietta, Ga., assignors to Georgia Tech Research Institute, Atlanta, Ga.

Filed Jun. 2, 1983, Ser. No. 500,540

Int. Cl.⁴ H03K *5/22*

U.S. Cl. 307—498 **22 Claims**



1. A four-quadrant quarter-square MOS transconductance multiplier, comprising:

a substrate;

plural MOS transistor formed in said substrate to form first and second differential summer stages each having a pair of inputs (V_1, V_2) and an output, and a pair of differential squaring stages, each having an input coupled to the output of a respective summer stage, said squaring stages interconnected to produce an output V_o, wherein said summer and squaring stages implement the quarter-square algebraic identity as follows,

$$V_o=\tfrac{1}{4}[(V_1+V_2)^2-(V_1-V_2)^2]=V_1V_2,$$

each differential summer stage comprising first through eighth MOS transistors including first and second input transistors having respective gates connected in differential mode to said first input V_1, third and fourth MOS transistors having respective gates connected in differential mode to said second input V_2, said first and second transistors have sources connected to each other, and to a negative supply voltage ($-V_{SS}$) via a first current source, and drains respectively connected in series with fifth and sixth NMOS transistors to a positive voltage source ($+V_{DD}$), the third and fourth transistors having sources connected to each other, and to $-V_{SS}$ via a second current source and drains connected respectively in series with the seventh and eighth transistors to $+V_{DD}$, fifth and sixth transistors having gates respectively connected to the interconnection between the third and seventh transistors and the interconnection between the fourth and eighth transistors, and the seventh and eighth transistors having gates also connected to $+V_{DD}$, each summer stage producing respective sum and difference signals (V_x, V_y) based on the polarity of the interconnection of the input signals thereto, across the interconnection between the first and fifth transistors and the interconnection between the second and sixth transistors,

each squaring stage comprising a pair of input MOS transistors having gates connected in differential mode to a respective of the outputs V_x, V_y of said summer stages, sources interconnected to each other and connected to $-V_{SS}$ via a third current source and drains interconnected to each other, and to $+V_{DD}$ through a load, each squaring stage producing an output at the interconnection of said drains of said pair of input MOS transistors, wherein the transistors of said squaring stages are operated in a saturation region; and

a differential-to-single-ended convertor coupled to the outputs of said squaring stages and having an output V_o corresponding to the product of V_1 and V_2.

4,546,276

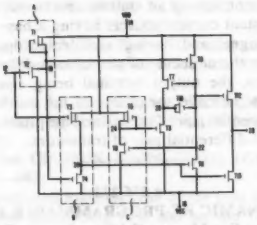
FULL OUTPUT VOLTAGE DRIVER CIRCUIT USING BOOTSTRAP CAPACITOR AND CONTROLLED DELAY CIRCUITRY

Ronald L. Freyman, Bethlehem, and Yehuda Rotblum, Allentown, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 29, 1982, Ser. No. 402,922

Int. Cl.⁴ H03K *4/24, 17/06, 17/687, 19/094*

U.S. Cl. 307—578 **16 Claims**



1. Circuitry comprising:

a first field effect transistor switching device having a gate terminal and first and second terminals;

a second switching device having a first terminal, a second terminal, and a control terminal, the first terminal thereof being coupled to the first terminal of the first field effect transistor device;

a circuitry output terminal being coupled to the first terminal of the first field effect transistor device;

a third switching device having a first terminal, a second terminal, and a control terminal, the first terminal thereof being coupled to the gate terminal of the first transistor device;

a fourth switching device having a control terminal, a first terminal, and a second terminal;

a circuitry input terminal being coupled to the control terminals of the third and fourth switching devices;

a fifth switching device having a control terminal, a first terminal, and a second terminal;

a capacitor means having a first terminal coupled to the first terminals of the third and fourth devices, and to the control terminal of the fifth device;

the first terminal of the fifth device being coupled to a second terminal of the capacitor means;

the second terminals of the first, third, and fifth switching devices being connectable to a first potential terminal;

the second terminals of the second and fourth switching devices being connectable to a second potential terminal; and

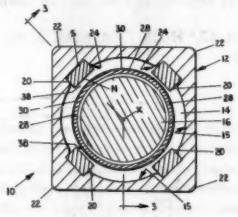
delay circuit means having first and second terminals coupled to the first and second terminals of the capacitor means, respectively.

4,546,277

LINEAR MOTOR

James T. Carbonneau, and Paul Stahel, both of Grand Rapids, Mich., assignors to Carbonneau Industries, Inc., Grand Rapids, Mich.

Filed Jul. 2, 1984, Ser. No. 626,684
Int. Cl.[4] H02K *41/02*
U.S. Cl. 310—13 **9 Claims**



1. A linear motor adapted for use to accurately control linear movement of a computer disk read/write transducer or the like where stray magnetic flux must be relatively minimal, the motor comprising:

an elongated housing uniform in cross-section along its length and constructed of a relatively low reluctance magnetic material, said housing having an outer surface and a central bore extending axially through the housing so as to form an inner housing surface, the outer surface and central bore being formed to provide alternating areas of thicker and thinner radial wall dimensions;

an elongated pole piece constructed of a relatively low reluctance magnetic material and mounted in the bore so as to form a continuous spacial area between the pole piece and the inner housing surface;

a plurality of radially polarized and elongated bar magnets mounted in the bore to the inner housing surface or the pole piece so as to extend longitudinally at least partially therethrough, the radially polarized magnets being positioned at the areas of thicker radial wall dimensions and between the areas of thinner radial wall dimensions;

a movable armature coil of conductive material concentrically disposed around the pole piece in the spacial area; and

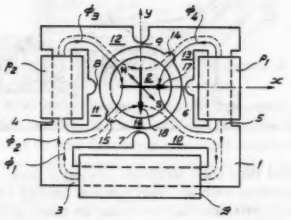
means for applying electric current of a desired magnitude and polarity to the armature coil in the presence of the magnetic fields of the radially polarized magnets so as to exert forces on the coil to move the coil in an axial direction, the forces having a direction dependent on current polarity and a magnitude proportional to the current magnitude.

4,546,278

WINDING FOR SUBJECTING THE ROTOR OF A STEPPING MOTOR TO TWO MAGNETIC FIELDS SYMMETRIC TO TWO PERPENDICULAR AXES BY ENERGIZATION OF ONE WINDING

Mai T. Xuan, Chavannes, Switzerland, assignor to Omega SA, Bienne, Switzerland

Filed Jun. 27, 1984, Ser. No. 625,148
Claims priority, application Switzerland, Jul. 6, 1983, 3699/83
Int. Cl.[4] H02K *37/00*
U.S. Cl. 310—49 R **3 Claims**



1. An electromagnetic stepping motor of the type responsive to sequences of energizing pulses and adapted in particular to drive a timepiece movement, said stepping motor comprising a stator and a rotor comprising a permanent magnet located in an opening of said stator, the magnetic circuit of said stator including a first winding and two second windings, each wound around a corresponding core, the axis of the core bearing said first winding being substantially perpendicular to the axes of the cores bearing said second windings, said stator having four pole shoes separated by saturable necks and cut-outs formed in the interior boundary wall of the stator opening which define a positioning angle for the rotor when the windings are not energized, the flux generated by energizing the first winding being separated into two substantially equal parts, the first of which is directly applied to the rotor via a first and a second pole shoe and the second of which passes through the core of each second winding in order to be applied to the rotor via a third and a fourth pole shoe thereby to subject the rotor to two magnetic fields which are substantially symmetric relative to two perpendicular axes.

4,546,279

DYNAMOELECTRIC MACHINE WITH ROTOR VENTILATION SYSTEM INCLUDING EXHAUST COOLANT GAS DIFFUSER AND NOISE BAFFLE

Joel B. Hammer, Plum Borough, and Richard A. Gronholm, East Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1984, Ser. No. 607,853
Int. Cl.[4] H02K *9/00*
U.S. Cl. 310—59 **6 Claims**

1. A dynamoelectric machine comprising:

a stator with a core and coil windings having end turns extending axially beyond ends of said core;

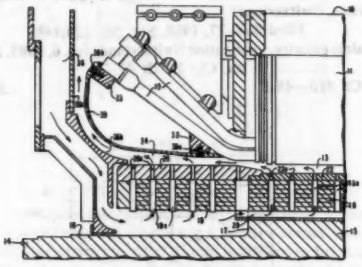
a rotor centrally disposed on a shaft for rotation within said stator;

said rotor comprising a body portion with axially opposing end faces, said body portion having a plurality of axially extending coil slots in each of which are located coils with end turns extending axially beyond each end of said rotor

body portion, said end turns having radially directed coolant passages;

a retaining ring located radially around said rotor end turns and having radially directed coolant passages communicating with said end turn coolant passages, said retaining ring and said rotor end turns being substantially directly radially inside said stator end turns,

a coolant inlet duct for supplying a coolant gas to radially inward ends of said end turn passages, said inlet duct having a first wall axially remote from said end turns and a second wall extending close to said end turns and said retaining ring; and,



a stator end turn shell structure having a smoothly curved configuration with an inner portion affixed to said stator end turns proximate said core and an outer portion affixed to said stator end turns proximate the axially outer extremity of said end turns, said shell structure substantially shielding said stator end turns from coolant passing outward through said passages of said rotor end turns and said retaining ring and confining coolant so passing to a region proximate an outer surface of said inlet duct second wall to define an outlet passage facilitating coolant flow therethrough.

4,546,280

ALTERNATOR WITH UNITARY BRUSH-HOLDER AND BEARING HUB

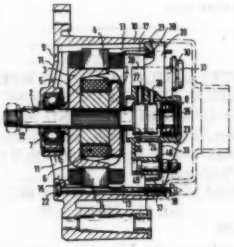
Gerhard Pflüger, Markgröningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,733

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300494

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 D **10 Claims**



1. Vehicular-type alternator having

slip rings (25,26) disposed near one axial end thereof;

a drive-side end shield (9);

a unitary slip-ring-side end shield, brush-holder, bearing support hub, and diode cooling plate support structure (20) of insulating material, located axially at the opposite end of the alternator from said drive-side shield (9) and secured thereto; a reception surface (30) formed in said shield structure (20); a voltage regulator (31) secured in said reception surface; electrical conductors (50) molded into said unitary structure (20);

a stator (13,14);

a rotor (1);

means (10) for securing the stator to the drive-side end shield (9), said means comprising a unitary extension of the drive-side end shield (9) projecting at least approximately over the region of slip rings (25,26) forming part of the rotor;

a drive-side bearing means (7) positioned in the drive-side end shield and journalling the rotor therein, located at one of the axial ends of the alternator;

a slip-ring-side bearing means (8) positioned in a bearing support hub portion (23,24) of said unitary slip-ring-side end shield structure (20) and journalling the rotor (1) therein;

current transfer brushes (27,28) for carrying current to and from said slip rings, disposed in a brush-holder portion (29) of said unitary structure (20);

multi-phase windings (14) on said stator; and

a rectifier array for rectification of alternating current produced in said multi-phase windings, including two sector-shaped diode support and cooling plates (33,34) disposed in a support portion (48) of said unitary structure (20).

4,546,281

MOTOR AND GEARING TO DRIVE A VALVE

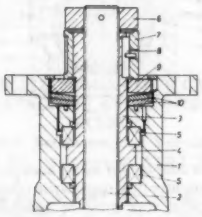
Manfred Gladisch, Herne, and Erwin Winklmann, Oberhausen, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,739

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1983, 3314781

Int. Cl.⁴ H02K *7/06*; F16K *31/02*

U.S. Cl. 310—83 **1 Claim**



1. Armature with a closure that can be displaced along an ascending spindle within a housing, comprising: a valve housing and a spindle sleeve in said housing; a transition bushing fastened to said spindle sleeve; said spindle being connected by said spindle sleeve and said transition bushing with an electric-motor adjusting means; a stroke-limiting nut screwed onto said spindle; an intermediate cover and a spring element between said transition bushing and said spindle sleeve; said transition bushing and said intermediate cover being displaceable along the spindle, said stroke-limiting nut moving against said transition bushing when said spindle is driven to an end position and continuous to be driven for displacing axially said transition bushing and said intermediate cover to apply load to said spring element, said transition bushing rubbing during rotation against said stroke-limiting nut and said intermediate cover for reducing energy and braking slowly said armature when said spindle continues to be driven after having reached an end position; said intermediate cover being cast onto said transition bushing; said spring element comprising a plurality of resilient rings that are displaceable toward each other axially and have conical faces resting together; said spindle sleeve having a stop

at a distance above said transition bushing, and another lower spring element on another side of the spindle mount between said spindle sleeve and said housing; said spring element being surrounded by an annular spring member, said annular spring member being positioned on one of its faces at a distance from said intermediate cover and resting with its other face on an initiating ring connected to said spindle sleeve; an additional annular spring member on another side of said initiating ring surrounding said spring element between said spindle sleeve and said housing and being positioned so that a distance is maintained between the initiating ring and said housing; and a non-resilient initiating bushing between said initiating ring and said annular spring member.

4,546,282

MAGNETIZABLE CORE FOR ACCOMMODATING ELECTRICAL CONDUCTORS IN AN ELECTRICAL MACHINE, AND A METHOD OF MANUFACTURING SUCH A CORE

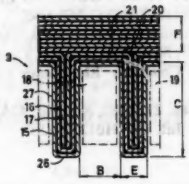
Carl S. M. Hartwig, Täby, Sweden, assignor to Institut Cerac S.A., Ecublens, Switzerland

Continuation of Ser. No. 499,979, Jun. 1, 1983, abandoned. This application Sep. 27, 1984, Ser. No. 655,351

Claims priority, application Switzerland, Jun. 29, 1982, 3970/82

Int. Cl.⁴ H02K *1/18*

U.S. Cl. 310—218 **5 Claims**



1. A magnetisable circular core for an electrical machine, such as electrical motor or an electrical generator, said circular core having on one surface thereof tooth-like projections (1, 2) and intermediate grooves (3, 4, 5) for accomodating electrical conductors (7, 8), the improvement wherein said circular core comprises a plurality of bent or folded strips (15, 16, 17; 31, 32, 33) arranged one tightly upon the other with tooth-like projections of respective strips extending one into the other to form substantially homogeneous magnetic poles, and wherein said plurality of bent or folded strips form a circular ring, and wherein said tooth-like projections are respective widths for mutually nestling strips so as to obtain close abutment between the inner surface of the tooth-like projections for an outer nestling strip and the outer surface of the tooth-like projections of the next following nestling strip, thereby eliminating free space in the poles formed by the tooth-like projections of the nested strips.

4,546,283

CONDUCTOR STRUCTURE FOR THICK FILM ELECTRICAL DEVICE

Michael D. Adamo, Bloomfield, Conn.; Cederick U. Darter, and Frederick Y. Cho, both of Scottsdale, Ariz., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 4, 1984, Ser. No. 607,094

Int. Cl.⁴ H01L *41/08;* **H05K** *7/02*

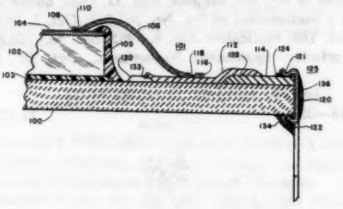
U.S. Cl. 310—313 R **20 Claims**

1. Connecting apparatus for conducting electrical currents between the pins of a lead frame and a resiliently mounted piezoelectric crystal and wafer mounted electrical components in a ceramic wafer thick film structure comprising the combination of:

aluminum film electrodes supported upon and electrically connected with said piezoelectric crystal;

first layer electrical conductor means located on said ceramic wafer for communicating electrical currents between said wafer mounted electrical components;

second layer electrical conductor means located on said ceramic wafer adjacent said lead frame pins and overlapping with said first layer conductor means at common predetermined fusion connection points;



aluminum wire bond means bonded at first ends thereof to said aluminum film electrodes on said piezoelectric crystal and bonded to said first layer electrical conductor means at the other ends thereof for connecting said piezoelectric crystal to said electrical components;

solder connecting means for connecting said second layer electrical conductor means with said lead frame pins.

4,546,284

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

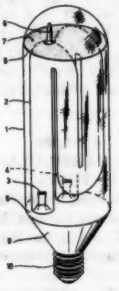
Max L. P. Renardus, and Bauke Sieswerda, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1979, Ser. No. 85,460

Claims priority, application Netherlands, Oct. 26, 1978, 7810672

Int. Cl.⁴ H01J *1/02, 7/24, 61/52*

U.S. Cl. 313—25 **2 Claims**



1. A low-pressure mercury vapor discharge lamp having a lamp envelope which encloses a folded tubular discharge vessel having a respective electrode at each end thereof, characterized in that the discharge vessel is provided with a projecting appendix located within the lamp envelope, which appendix is kept at a relatively low temperature by a heat shield, located within the lamp envelope, which cooperates with said projecting appendix to constrain relative movement therebetween, by being provided with an aperture which is demensioned for engagement with said projecting appendix,

and which shields the outer wall surface of the appendix from the outer wall surface of the discharge vessel.

4,546,285

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP

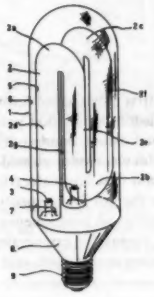
Jean J. Heuvelmans; Winston D. Couwenberg, and Franciscus A. S. Ligthart, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 646,043, Aug. 31, 1984, abandoned, which is a continuation of Ser. No. 307,715, Oct. 2, 1981, abandoned. This application Apr. 8, 1985, Ser. No. 720,653

Claims priority, application Netherlands, Oct. 29, 1980, 8005921

Int. Cl.⁴ H01J *61/12, 61/20, 61/34*

U.S. Cl. 313—25 **11 Claims**



1. A low-pressure mercury vapor discharge lamp having a discharge vessel which is closed in a vacuum-tight manner and contains mercury and at least one rare gas, electrodes being arranged one at each end in said discharge vessel between which a discharge is maintained during operation of the lamp, the discharge vessel being shaped and dimensioned such that the discharge path is curved in one or more places, an amalgam further being provided in the discharge vessel to control the mercury vapor pressure in the discharge vessel, said lamp having a lamp base intended for connection to a low-frequency a.c. line voltage, said one rare gas being krypton and constitutes the sole rare gas or part of a rare gas mixture which contains at least 50 at.% krypton, the krypton being at a pressure from 130 to 520 Pa, said discharge path being surrounded by a glass wall of said discharge vessel which has an inner diameter which is between 10 and 12 mm.

4,546,286

ELECTRON TUBE, IN PARTICULAR A TRANSMITTER TUBE

Hans Holenstein, Schmiedhof, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jul. 27, 1983, Ser. No. 517,678

Claims priority, application Switzerland, Jul. 27, 1982, 4554/82

Int. Cl.⁴ A47B *96/00*

U.S. Cl. 313—296 **9 Claims**

1. An electron tube:

(a) with a coaxial electrode design and

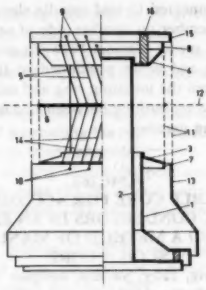
(b) a directly heated cathode comprising a plurality of separate cathode wires running parallel to one another,

(c) said plurality of separate cathode wires being placed on a generatrix of a cylindrical surface between superposed electric connecting rings,

(d) said connecting rings being rigidly connected to one another by connecting plates which are in electrical contact with current feeds,

(e) said plurality of cathode wires being located on generatrices the pitches of which change sign between said connecting rings,

(f) each of said plurality of cathode wires forming an acute angle with said connecting rings, and



(g) said plurality of cathode wires being interconnected by at least one support ring which is rotatable relative to said connecting rings.

4,546,287

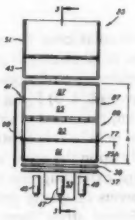
CATHODE RAY TUBE FOCUSING ELECTRODE SHIELDING MEANS

Floyd K. Collins, Seneca Falls; Frederick A. Hovey, Geneva, and Loren L. Maninger, Marcellus, all of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,117

Int. Cl.⁴ H01J *29/58*

U.S. Cl. 313—414 **17 Claims**



1. In a plural beam in-line color cathode ray tube, an electron gun assembly comprising a plurality of electrodes positioned sequentially forward of rear-oriented electron emitting cathodes, said electrodes including a focusing electrode, a final accelerating electrode positioned forward of the focusing electrode, and a convergence cup positioned forward of the final accelerating electrode, the focusing electrode structure having a focus voltage and having forward and rear plural apertured portions, said focusing electrode structure being formed of an integration of a plurality of electrically connected cup-shaped components having depth and elongated lateral transverse dimensions, each of said components having an open portion and a substantially closed portion with a plurality of in-line apertures therethrough, at least two of said components being positioned with their open portions in abutted relationship to form a box-like enclosure, said focusing electrode structure incorporating beam shielding means comprising:

at least one in-line apertured planar shielding formed of magnetic material and oriented transverse to the beam path forward of said rear apertured portion for shielding

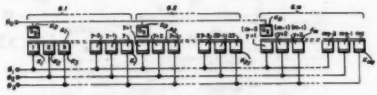
the electron beams from the influence of the backfield of an externally positioned magnetic deflection yoke.

4,546,288

ARRANGEMENTS FOR FAST READOUT OF N STAGE ARRAYS OF GAS DISCHARGE CHAMBERS

Dieter Fischer, Frankfurt, and Karl-Heinz Vatterott, Duderstadt, both of Fed. Rep. of Germany, assignors to Triumph-Adler Aktiengesellschaft bur Buro- und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed May 26, 1983, Ser. No. 498,461
Int. Cl.[4] H01J *17/48;* **G09G** *3/00*
U.S. Cl. 315—169.4 **5 Claims**



1. Apparatus for fast readout of an n stage array of gas discharge chambers having m groups of y stages,

said my stages comprising my interconnected gas chambers each bounded by an anode and a cathode,

said gas chambers being adapted when primed by discharge of a preceding gas chamber to be discharged by voltage pulses of a magnitude insufficient to discharge unprimed gas chambers,

multi phase lines for carrying trains of phase displaced voltage pulses totaling my pulses connected to said cathodes for sequentiaaly addressing said my cathodes, the number of stages y in each group being a multiple of said lines, and

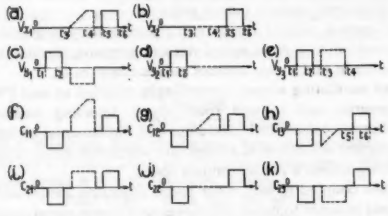
means for priming the first gas chamber in each of said groups whereby said groups are read out stage serially in parallel upon application of said voltage pulse trains.

4,546,289

PROCESS FOR ESTABLISHING CONTROL SIGNALS FOR AN ALTERNATING PLASMA PANEL

Louis Delgrange, Paris, France, assignor to Thomas-CSF, Paris, France

Continuation of Ser. No. 302,568, Sep. 15, 1981, abandoned. This application Apr. 27, 1984, Ser. No. 604,817
Claims priority, application France, Sep. 9, 1980, 80 19415
Int. Cl.[4] H05B *37/00*
U.S. Cl. 315—169.4 **7 Claims**



1. A process for establishing control signals for an alternating plasma panel, in which these signals are applied to two electrodes belonging to two orthogonal networks, and each cell of the panel is formed by the gaseous space located at the intersection between two electrodes in different networks, said procedure being characterized by the fact that:

a "selection" voltage (Vx1) is applied to one of the electrodes in one of the networks, and a "non-selection" voltage (Vx2) is applied to the other electrodes in the same network;

simultaneously, a "setting" voltage and a "clearing" voltage (Vy1 and Vy2) are applied respectively to the two electrodes in the other network; the form, amplitude and duration of such voltages being such that cells receiving the selection voltage at one electrode and the setting voltage or clearing voltage at the other electrode are either set or cleared accordingly, while cells receiving the non-selection voltage at one electrode are all maintained in their initial state, regardless of the voltage applied to the other electrode; and

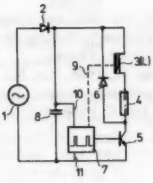
"maintenance" voltage, and cells receiving the maintenance voltage at one electrode and the selection or non-selection voltage at the other electrode being maintained in their initial state.

4,546,290

BALLAST CIRCUITS FOR DISCHARGE LAMP

Béla Kerekes, Budapest, Hungary, assignor to Egyesult Izzolampa es Villamossagi Rt., Budapest, Hungary

Continuation of Ser. No. 372,344, Apr. 27, 1982, abandoned. This application May 15, 1984, Ser. No. 610,918
Claims priority, application Hungary, May 8, 1981, 1226/81
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—209 R **8 Claims**



1. A high frequency ballast circuit for limiting the operating current of a discharge lamp, the circuit comprising a choke coil and a switching transistor connected in series with the discharge lamp therebetween and a diode shunt connected across the choke and the lamp with the forward direction of the diode being opposite to that of the switching transistor and a control circuit receptive of rectified line voltage for producing a 1–100 kHz frequency square wave of asymmetric periodicity and applying same to the input of the switching transistor, wherein the period of the square wave is greater than the time during which current is supplied to the discharge lamp which is the sum of the switching-on time t_1 and the switching-off time t_2.

4,546,291

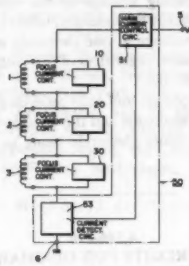
FOCUS CIRCUIT FOR MULTI-TUBE IMAGE PICK-UP APPARATUS

Yoshihiro Morioka, and Hiroyuki Sugimoto, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,724
Claims priority, application Japan, Mar. 5, 1981, 56-31760
Int. Cl.[4] H01J *29/58*
U.S. Cl. 315—382 **11 Claims**

1. A focus current control circuit for a multi-tube image pick-up apparatus having a plurality of electromagnetic focusing type image pick-up tubes including respective focusing coils connected in series with each other, comprising: main focus current control means connected in series with said series-connected focusing coils for controlling a main focus current so as to maintain a predetermined value thereof, and a plurality of individual focus current control means respectively corresponding to said plurality of image pick-up tubes and each being connected in parallel with the respective one of said focusing coils for controlling an individual focus current

flowing through said respective focusing coil, each of said individual focus current means including a constant current



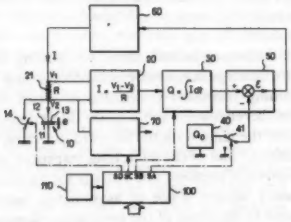
circuit which bypasses a portion of said main focus current away from said respective focusing coil.

4,546,292

ELECTRONIC CIRCUIT FOR CONSTANT CHARGE CONTROL OF AN ELECTROSTATIC MOTOR, IN PARTICULAR FOR AN ACCELEROMETER OR A RATE GYRO

Jean-Thierry Audren, Les Ulis, and Charlie Pelletier, Massy, both of France, assignors to Societe de Fabrication d'Instruments de Mesure, Massy, France

Filed May 21, 1984, Ser. No. 612,151
Claims priority, application France, Jun. 1, 1983, 83 09066
Int. Cl.[4] H02N *1/00*
U.S. Cl. 318—116 **6 Claims**



1. A control circuit for controlling an electrostatic motor in the form of a capacitor including first and second relatively movable electrodes with a gap between said electrodes, the control circuit controlling the force applied between said motor electrodes as a function of a force reference signal, wherein the control circuit comprises:

a source of DC voltage applied between the electrodes of the capacitor;

measurement means for measuring the resulting flow of current to the capacitor;

integrator means for integrating the current thus measured to deliver a signal representative of the quantity of charge stored in the capacitor;

comparator means for delivering an error signal representative of the difference between said measured quantity of charge and a reference signal which is a function of the said force reference signal; and

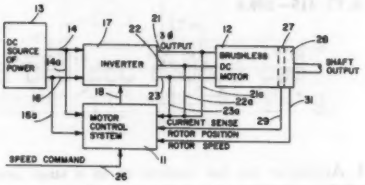
servo-control means for modifying the value of the DC voltage delivered by the said source of DC voltage in such a manner as to tend to cancel said error in order to maintain the constant charge on the capacitor while said DC voltage is being applied thereto and regardless of any variations in the capacitance of the capacitor due to variations in the gap between its electrodes.

4,546,293

MOTOR CONTROL FOR A BRUSHLESS DC MOTOR

William J. Peterson, and Dennis T. Faulkner, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 24, 1982, Ser. No. 411,075
Int. Cl.[4] H02K *23/00*; H02P *1/18*
U.S. Cl. 318—254 **3 Claims**



1. A motor control means for a brushless DC motor having a rotor wherein a DC source of power is mutually coupled to a PWM inverter and to said motor control means,

said motor control means controllingly coupled to said PWM inverter,

said PWM inverter having a fundamental current waveform output signal delivered to said motor, the phase of said fundamental current waveform controlled by said motor control means,

said motor control means responsive to a speed command input and responsively coupled to a motor rotor position pulsed sensing means that provides a rotor position waveform signal through said motor control means to said inverter whereby said sensed rotor position waveform signal causes said inverter to provide a fundamental switched current waveform, said fundamental switched current waveform being pulse width modulated at a rate to thereby control output voltage,

said motor control means being additionally responsively coupled to a rotor speed detecting means, the improvement in said motor control means comprising,

fixed oscillating means controllingly coupled to said PWM inverter and to said rotor speed detecting means to thereby pulse width modulate said fundamental switched current waveform at a fixed rate when said motor is operating below a predetermined speed,

means coupled to said rotor speed detecting means and to said inverter to cause, whenever said motor speed exceeds said predetermined speed, said inverter fundamental current waveform output to be switched at a rate proportional to said rotor speed and to be pulse width modulated at a rate proportional to rotor speed, and

fundamental current waveform phase advance means controllingly coupled to said inverter, said phase advance means coupled to receive said pulsed waveform signal from said rotor speed detecting means and phase advance said pulsed waveform signal a predetermined amount as a function of rotor speed above said predetermined speed to thereby cause said fundamental current waveform to be phase advanced and to lead the motors back EMF waveform.

4,546,294

APPARATUS FOR REMOVING TORQUE RIPPLES IN A DIRECT CURRENT MOTOR

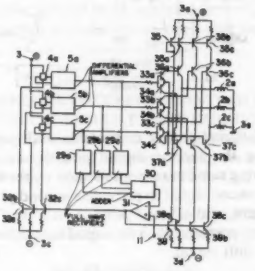
Itsuki Ban, 3-50-18, Higashi Oizumi Nerima-ku, Tokyo, and Akihiro Nakajima, 9-8 Ichibayamatocho, Tsurumi, Yokohama, Kanagawa, both of Japan

Continuation of Ser. No. 360,439, Mar. 22, 1982, abandoned. This application Feb. 6, 1985, Ser. No. 699,482

Claims priority, application Japan, Mar. 26, 1981, 56-43201; Apr. 1, 1981, 56-47238; Apr. 30, 1981, 56-64282

Int. Cl.[4] H02K *29/00*

U.S. Cl. 318—311 3 Claims



2. An apparatus for removing torque ripples in a direct current motor including a magnet rotor, and polyphase stator armature coils having conductors attributable to torque generation and controllably energizable in response to angular positions of the magnet rotor, said apparatus comprising:

means for detecting magnetic fields and producing signals indicative of the detected magnetic fields, said means being fixed in phase with the conductors of the polyphase armature coils;

energization circuit means for energizing the armature coils with currents in response to the output signals from said detecting means;

operational circuit means for effecting an arithmetic operation to obtain a combination of output torques generated by the energized armature coils from the output signals of said detecting means and the currents flowing through said detecting means, which currents are proportional to the currents flowing through the energized armature coils; and

control circuit means for controlling said currents flowing through the energized armature coils so as to bring the combination into conformity with a value corresponding to a desired output torque from the motor.

4,546,295

ELECTRIC ACTUATORS

David J. Wickham; Jack Washbourn, both of Chippenham, and Howard F. Cogan, Leire, all of England, assignors to Westinghouse Brake & Signal, Wiltshire, England

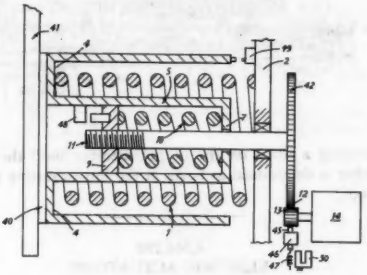
Filed May 7, 1984, Ser. No. 607,631

Claims priority, application United Kingdom, May 12, 1983, 8313102; Jun. 23, 1983, 8317063; Jun. 23, 1983, 8317064; Oct. 4, 1983, 8326467

Int. Cl.[4] H02K *7/06, 7/10*

U.S. Cl. 318—372 8 Claims

1. An electric actuator having an output member movable from a first variable position to a second variable position; a spring means for exerting a variable output force on said output member for transmission thereby, when said output member is in the second position thereof; an electric motor means for controlling said spring means to control the variable output force exerted on the output member when the output member is in second position thereof; means for generating an electrical signal when the output member is about to leave the second position for return thereof to the first position; and motor-control electrical circuit means, responsive to the generation of the electrical signal, for controlling the operation of the electric



motor so as to cause the output member to move a predetermined distance back to the first position which maintains a substantially constant spacing between the first and second positions.

4,546,296

ELECTRIC ACTUATORS

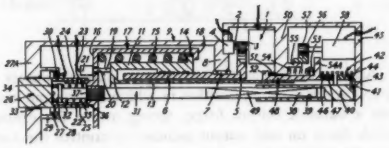
Jack Washbourn, Chippenham, and Howard F. Cogan, Leire, both of England, assignors to Westinghouse Brake & Signal, Wiltshire, England

Filed May 7, 1984, Ser. No. 607,632

Claims priority, application United Kingdom, May 12, 1983, 8313102; Jun. 23, 1983, 8317063; Jun. 23, 1983, 8317064; Mar. 20, 1984, 8407178; Mar. 20, 1984, 8407177

Int. Cl.[4] H02K *7/10*

U.S. Cl. 318—372 15 Claims



1. An electric actuator comprising an output member movable from a first position to a second, force exerting position, spring means for exerting a variable force on said output member for transmission by said output member, when the output member is in the force exerting position thereof, a variable output electric motor for varying the variable force exerted by said spring means on said output member in accordance with the output of the electric motor.

4,546,297

ELECTRIC ACTUATORS

Jack Washbourn, Chippenham, and Howard F. Cogan, Leire, both of England, assignors to Westinghouse Brake & Signal, Wiltshire, England

Filed May 7, 1984, Ser. No. 607,634

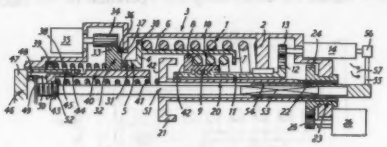
Claims priority, application United Kingdom, May 12, 1983, 8313102; Jun. 17, 1983, 8316544; Jun. 17, 1983, 8316545

Int. Cl.[4] H02K *7/10*

U.S. Cl. 318—372 13 Claims

1. An electric actuator having an output member movable into and out of a force-exerting position, a spring system, electric motor means for moving the output member to and from the force-exerting position thereof and, for when the output member is in that position, controlling the spring system

to generate a required variable output force on the output member, and means for withholding the spring system from



generating a force on the output member until the output member is determined as being in the force-exerting position thereof.

4,546,298

ELECTRIC ACTUATORS

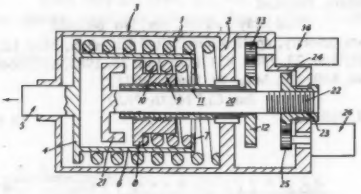
David J. Wickham; Jack Washbourn, both of Chippenham, and Howard F. Cogan, Leire, all of England, assignors to Westinghouse Brake & Signal Co., Wiltshire, England

Filed May 7, 1984, Ser. No. 607,633

Claims priority, application United Kingdom, May 12, 1983, 8313102; Jun. 17, 1983, 8316544; Jun. 17, 1983, 8316545; Jun. 23, 1983, 8317064; Oct. 4, 1983, 8326467; Mar. 20, 1984, 8407177

Int. Cl.⁴ H02K *7/10, 7/06*

U.S. Cl. 318—372 **14 Claims**



1. An electric actuator comprising an output member movable to a force exerting position in which said output member exerts a variable output force, spring means for exerting a variable force on said output member to control the variable output force exerted by said output member, an electric motor for determining the output force exerted on said output member by said spring means, a stop means for limiting the maximum value of the output force exerted by said spring means, and adjustment means for varying the position of the stop means in accordance with the maximum value of the output force required to be exerted by the output member.

4,546,299

LOW COST SERVO OPERATED DIGITAL POSITIONING SYSTEM

John R. Veale, Manhattan Beach, Calif., assignor to Manhattan Engineering Co., Inc., Torrance, Calif.

Filed Dec. 20, 1983, Ser. No. 563,405

Int. Cl.⁴ G05B *1/01*

U.S. Cl. 318—608 **19 Claims**

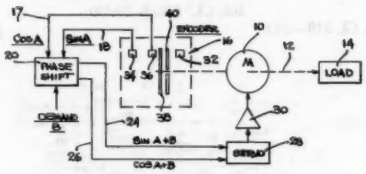
1. In a closed loop digital control system having a moveable member adapted for movement to a command position in response to a command position signal, an encoding means for providing a first digital position information sine signal and a second digital position information cosine signal and a motive means for moving the moveable member, an improvement comprising:

(a) a first digital-analog conversion-multiplying means for receiving the first digital position sine signal and converting same,

(b) first memory means for providing a sine function of a demand signal,

(c) first digital-analog coversion-multiplying means for receiving the first digital position signal and multiplying same in response to and by the sine function of the demand signal to provide a first phase shift signal component,

(d) a second memory means providing a cosine function of the demand signal,



(e) second digital-analog conversion-multiplying means for receiving the second digital position cosine signal and multiplying same in response to and by the cosine function of the demand signal to provide a second phase shift signal component, and

(f) means to combine the two signal components to provide a phase shift signal.

4,546,300

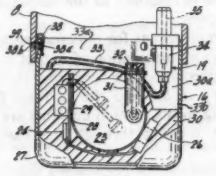
ELECTRIC POWER SUPPLY CONNECTION FOR SUBMERSIBLE CAPACITOR-START MOTOR APPARATUS

Maqboolhusein G. Shaikh, Troy, Ohio, assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Mar. 17, 1983, Ser. No. 476,116

Int. Cl.⁴ H02P *1/42*

U.S. Cl. 318—786 **3 Claims**



1. A submersible motor-pump apparatus having a vertical operating position with the pump above the motor and adapted to be operated from a two-wire power supply or a three-wire power supply, comprising a submersible motor, an integrated capacitor and switch unit adapted to be secured to said motor to form an integrated part of the submersible motor and operable submersed in a well, a three terminal connector means including a first part connected to the bottom of said motor and a second part connected to said capacitor unit, said first and second parts located and held in operative circuit completion engagement with said capacitor and switch unit mounted to said motor, said capacitor and switch unit including a sealed housing having said second connector part mounted in the outer portion thereof and in sealed relation to maintain a fluid tight enclosure, a capacitor within said housing, a solid state gated switch located within said housing, said solid state gated switch being connected in series with said capacitor in a start branch and including a triggered gate means, said second connector part including first and second terminal members connected to the opposite ends of said start branch and having a seperate third terminal member connected to said gate means, whereby said start branch circuit is connected in series with said start winding and said gate means is connected to sense the current flow in the motor run winding to automatically discon-

nect said start branch in response to a predetermined motor speed, a second three-terminal connector means secured to the upper end of said motor and having three terminals connected to said motor and adapted to be connected to a two-wire supply or to a three wire supply, and a shorting plug adapted to be coupled to said first connector part with said three wire supply connection to said motor, a potting material in said housing encapsulating said capacitor and said switch, said capacitor being subject to malfunction and generating an abnormal pressure within said potting material and said potting material including a releasably sealed vent opening extending from said capacitor to the exterior of said housing, a pressure responsive seal means in said vent opening operable to withstand the pressure in said well and responsive to a pressure created by capacitor malfunction to open said vent opening.

4,546,301

CIRCUIT AND METHOD FOR CONTROLLING AN ALTERNATING OR THREE-PHASE CURRENT MOTOR

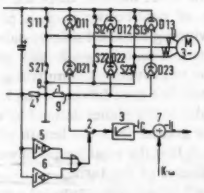
Manfred Tinebor; Gustav Matthies, and Heinz-Dietmar Karl, all of Barntrup, Fed. Rep. of Germany, assignors to Maschinenfabrik Stahlkontor Weserlenze GmbH & Co., Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 584,970

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307623

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—798 **6 Claims**



1. A method for controlling the reactive current of an alternating current motor which is fed by voltages which are amplitude and frequency controlled by a direct voltage intermediate circuit and an inverter circuit having electronic switches and corresponding anti-parallel recovery diodes providing feedback current from the motor inductance to a capacitor of said intermediate circuit, comprising:

interrupting on a time basis the feedback current to develop a signal component proportional to the reactive current of the motor;

measuring the magnitude of said signal component which is proportional to said reactive current;

generating a control signal from said measured magnitude which is directly proportional to said reactive current; and

controlling the amplitude and frequency of voltages of said voltage fed to said motor with said inverter in response to said control signal.

4,546,302

PROTECTIVE SENSING MEANS FOR BATTERY CHARGING CIRCUIT

Leonard S. Smith, Eden Prairie, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.

Continuation-in-part of Ser. No. 933,417, Aug. 14, 1978, abandoned. This application Sep. 22, 1980, Ser. No. 189,118

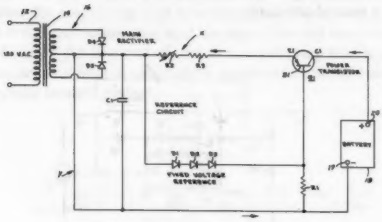
Int. Cl.⁴ H02J *7/00*

U.S. Cl. 320—25 **2 Claims**

1. A circuit protecting a current regulating battery charger from a condition of short circuiting or reverse polarity originating at the battery, the charging circuit included consisting of a power transistor in circuit with an emitter-collector load circuit and a base, the protector circuit comprising

a reference voltage sensing means and the base and emitter junction of a protector transistor forming a path across said load circuit of said power transistor,

said means having a predetermined reference voltage sensing a voltage drop across said load circuit of said power transistor caused by a condition at the battery,



said protector transistor having an input to the base of said power transistor, and

said reference voltage sensing means causing said protector transistor to bias said base of said power transistor to shunt current in excess of said reference voltage.

4,546,303

STATIC REACTIVE-POWER COMPENSATION APPARATUS

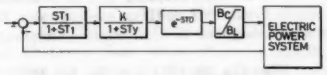
Takafumi Maeda, and Setsurou Mine, both of Tokyo, Japan, assignors to Tokyo Electric Power Co., Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,662

Claims priority, application Japan, Mar. 29, 1983, 58-53114

Int. Cl.⁴ G05F *1/70*

U.S. Cl. 323—210 **3 Claims**



1. A static reactive-power compensating apparatus comprising: reactor energy storing means; thyristor means for selectively coupling said energy storing means to a power system to compensate for voltage variations in said power system; a thyristor control circuit for controlling said thyristors; a rectifier circuit for rectifying a line voltage of said power system; and a reset filter circuit having an input coupled to an output of said rectifier and an output applied to a controlling input of said thyristor control circuit.

4,546,304

ELECTRONIC DEVICE WITH CHOKE INVERTER

Gerhard Schwarz, Altena, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,500

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310678

Int. Cl.⁴ G05F *1/56*

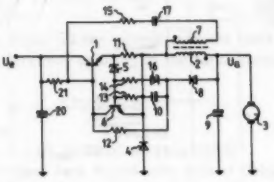
U.S. Cl. 323—287 **6 Claims**

1. In an electronic circuit for supplying current to an electrical device from an AC or DC voltage source of varying voltage level, said electronic circuit including a choke inverter including a switching transistor connected in series with a choke, the base of said switching transistor being connected to a regulator circuit for regulating the output voltage, whereby in the conducting phase of the switching transistor a first

capacitor connected in parallel with the electrical device is charged and in the blocking phase of the switching transistor the energy stored in the choke flows through a first diode into the first capacitor which discharges through the electrical device, that improvement comprising:

a first resistor connected between a load terminal of said switching transistor and said choke;

a second transistor;



a zener diode, said zener diode and the base and emitter of said second transistor forming a series circuit connected in parallel with said second transistor;

the base of said switching transistor being connected to the collector of said second transistor; and

a feedback winding magnetically coupled with said choke and connected between said base of said switching transistor and the junction of said choke and said load terminal of said switching transistor.

4,546,305

MAINS-VOLTAGE DISCRIMINATION DEVICE

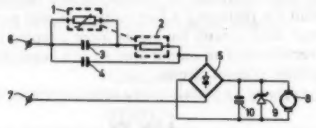
Bernardus H. A. Goddijn, deceased, late of Drachten, Netherlands, and by Friedrich J. de Haan, administrator, Dommelen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 29, 1983, Ser. No. 508,960

Claims priority, application Netherlands, Jul. 2, 1982, 8202666

Int. Cl.[4] G05F *5/00*

U.S. Cl. 323—299 **20 Claims**



1. A mains-voltage discrimination device for adapting a load to a lower or an upper alternating voltage range, comprising a resistor with a positive temperature coefficient (PTC-resistor) connected in series with a voltage-dependent resistor having such a resistance and disposed in such a way that its resistance in the upper alternating-voltgage range is lower than in the lower alternating-voltage range, characterized in that the PTC-resistor and the voltage-dependent resistor have characteristics such that in the upper alternating-voltage range, at least initially, the voltage-dependent resistor dissipates more power than the PTC-resistor, and both resistors are in close thermal contact with each other so that initially the temperature of the PTC-resistor is determined mainly by the dissipation in the voltage-dependent resistor.

4,546,306

VOLTAGE STABILIZING TRANSFORMER

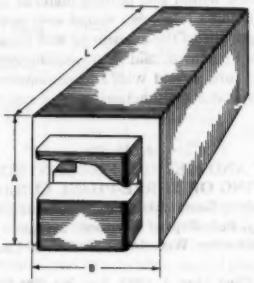
Emilio C. Alba, Condado de Trevino 12, and Angel R. Pacho, Paseo de la Habana 40, both of Madrid, Spain

Filed Jun. 20, 1980, Ser. No. 161,448

Claims priority, application Spain, Jul. 10, 1979, 482374

Int. Cl.[4] G05F *3/06*

U.S. Cl. 323—308 **6 Claims**



1. In a gaseous discharge lamp stabilizing transformer having a square magnetic circuit formed from a plurality of planar laminations of low magnetic reluctance materials arranged parallel to each other in a stack to form a shell-like elongated core, a central inner member disposed in said core for support of windings of conductive wire, a primary winding and a secondary winding disposed side-by-side on said inner member and a magnetic shunt between said primary and secondary windings, the improvement comprising:

(a) said shell-like core having a stack length dimension perpendicular to the planes defined by said planar laminations which is greater than the length of a side of said laminations such that the axial length of said windings is less than the perimeter of the turns;

(b) said stack length dimension for a transformer of predetermined input and output operating characteristics and core magnetic cross-sectional area being maximized by making the differential of the combined value of the conducting material and the magnetic material with respect to said stack length dimension equal to zero, whereby the number of winding turns required is minimized and the regulating effect of leakage inductance variations is maximized.

4,546,307

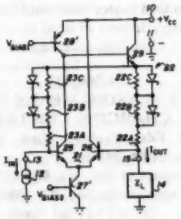
NPN TRANSISTOR CURRENT MIRROR CIRCUIT

William D. Llewellyn, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 3, 1984, Ser. No. 567,713

Int. Cl.[4] H03F *3/45*

U.S. Cl. 323—315 **6 Claims**



1. A current mirror circuit for sourcing output current to a load element as a linear function of a current, coupled as an input to said circuit, said circuit comprising:

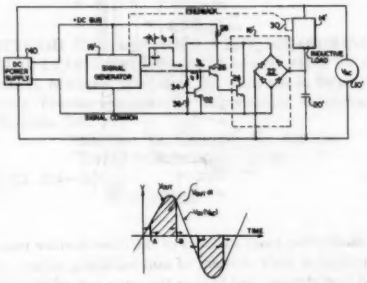
a differential amplifier having inverting and non-inverting inputs and an output;
first resistive means coupled between said differential amplifier output and said inverting input;
second resistive means coupled between said differential amplifier output and said non-inverting input;
means for coupling an input current to said inverting input;
means for coupling an output load to said non-inverting input; and
means for making said first and second resistive means non-linear whereby the resistance is reduced as a function of increasing current.

4,546,308

CONTROL OF AC POWER TO INDUCTIVE LOADS

Don F. Widmayer, 4704 Locust Hill Rd., Bethesda, Md. 20814

Filed Jan. 19, 1984, Ser. No. 571,830
Int. Cl.⁴ G05F 1/445
U.S. Cl. 323—319 **7 Claims**



1. In a system for controlling AC power supplied from an AC source to an inductive load of the type comprising a switch connected between the AC source and the inductive load, control means for controlling switching of said switch in timed relation to the AC source carrier wave so as to control the power supplied to said inductive load, and a capacitor connected in shunt across the switch, said control means controlling the operation of said switch such that the switch is closed near the beginning of each half wave of the AC source carrier wave and such that the switch is opened at a subsequent, variable time during each half wave, said system further comprising sensing means for sensing the voltage on said switch during each half wave and for inhibiting closing of said switch by said control means during the half wave until the voltage on said switch is substantially zero.

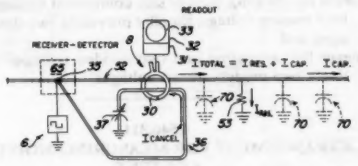
4,546,309

APPARATUS AND METHOD FOR LOCATING GROUND FAULTS

Chang E. Kang, DeKalb; L. Alan Lowry, Glen Ellyn, and Merlin E. Burkum, Elmhurst, all of Ill., assignors to Commonwealth Edison Company, Chicago, Ill.

Filed Sep. 13, 1982, Ser. No. 416,977
Int. Cl.⁴ G01R 31/08, 31/02
U.S. Cl. 324—52 **8 Claims**

1. An apparatus for precisely locating unintentional grounds on electric cables or ungrounded direct current power control systems, including in combination,
a low frequency electric current generator having a variable output voltage for generating a low frequency current signal and which is to be operatively connected to the cables of an ungrounded direct current power control system;
a Hall-effect current probe having a split magnetic core for positioning about and around the cables of said control system for detecting a low frequency current signal in the cables produced by said generator;
a narrow band-pass filter connected to the output of said Hall-effect current probe for substantially blocking all signal frequencies except the low frequency signal transmitted on said cables in said signal generator;
a signal amplifier connected to the output of said band-pass filter for amplifying said low-frequency signal;
a first current connecting lead having a first and second end of which the first end of said first conducting lead is connected to a faulted cable of the ungrounded direct current power control system;



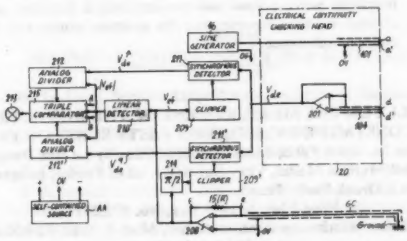
a variable capacitor having a first and second terminal wherein said first terminal is connected to the second end of said first conducting lead; and
a second current conducting lead having a first and second end of which the first end is connected to said second terminal of said variable capacitor and said second end of said first conducting lead is passed through said magnetic core and connected to ground such that the direction of the low frequency current in said second conducting lead is in a direction to oppose the effect of the low frequency current in the faulted cable, and
readout means connected to the output of said amplifier for indicating the relative magnitude of said low frequency signal to identify the precise location of the ground fault.

4,546,310

ELECTRICAL CONTINUIMETER

Michel J. Chatanier, Saint Maur; Michel J. Portat, Villebon-sur-Yvette, and Alain E. Bruère, Chevilly-Larue, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France

Continuation-in-part of Ser. No. 302,618, Sep. 15, 1981, Pat. No. 4,446,424. This application Oct. 7, 1983, Ser. No. 539,815
Claims priority, application France, Oct. 17, 1980, 80 22329
Int. Cl.⁴ G01R 27/02, 27/26
U.S. Cl. 324—52 **4 Claims**



1. A continuimeter device for checking the electrical continuity of a path defined on a structure, said structure being coated with an inner resistive layer and an outer insulating superficial layer, said device comprising:
a ground terminal electrically connected to said structure;
a pick-up to be placed on said structure surface, formed of an

inner cylindrical electrode and an outer annular electrode coaxial with said inner electrode;

means for applying a supply alternating voltage between said inner electrode and said ground terminal, thereby producing a current between said inner electrode and ground terminal;

means for applying said current to a load resistor and measuring the voltage across said load resistor;

means for measuring the voltage appearing between said outer electrode and ground terminal;

means for forming two components of said voltage between said outer electrode and ground terminal, respectively cophasal and in phase quadrature with said load resistor voltage;

means for dividing each of said component voltages by said load resistor voltage, thereby providing two divided voltages; and

means for comparing said two divided voltages to respectively two predetermined voltages.

4,546,311

ARRANGEMENT FOR MEASURING MOISTURE CONTENT

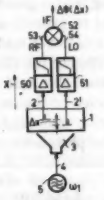
Reinhard Knöchel, Kölln-Reisiek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1982, Ser. No. 450,314

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150202

Int. Cl.⁴ G01R *27/04*

U.S. Cl. 324—58.5 R **8 Claims**



1. An apparatus for measuring the moisture content of an aqueous substance, comprising:

(a) transmitting means arranged for radiating a substantially flat AC electromagnetic wave into the aqueous substance;

(b) receiving means including at least one probe disposed in the aqueous substance for sensing the electromagnetic wave at first and second positions separated by a predetermined distance in the direction of propagation of the wave through the aqueous substance;

(c) evaluation means electrically-coupled to the receiving means for measuring the change in phase of the electromagnetic wave across said predetermined distance, said change in phase representing the moisture content of the aqueous substance.

4,546,312

CELL FOR THE MEASUREMENT OF THE DIELECTRIC CONSTANT OF VISCOUS OR PASTY SUBSTANCES

Alain M. Brun, Paris; Louis Marcotte, Chevilly La Rue Rungis, and Myriam Mellul, Vitry-Sur-Seine, all of France, assignors to L'Oreal, Paris, France

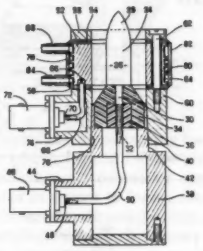
Filed Mar. 4, 1983, Ser. No. 472,247

Claims priority, application France, Mar. 4, 1982, 82 03606

Int. Cl.⁴ G01R *27/26*

U.S. Cl. 324—61 P **11 Claims**

1. In a cell for the measurement of the dielectric properties of a viscous or pasty substance comprising: first and second separable elements, said first separable element having an outer cylindrical electrically conductive surface and forming an internal electrode and said second separable element having an inner cylindrical electrically conductive surface and forming an external electrode; a first terminal connected to said first separable element; a second terminal connected to said second separable element; and centering means to keep said first and second separable elements in cooperation with each other in an operating position wherein said inner and outer cylindrical electrically conductive surfaces are substantially coaxial and are at least partly disposed opposite each other; the improvement comprising: (a) inner cylindrical surface means extending said inner cylindrical surface of the external electrode at each one of its ends, said inner cylindrical surface means comprising means defining an electrically insulating surface adjacent to said inner cylindrical surface of the external electrode and also an electrically conductive cylindrical surface therebeyond, the said electrically conducting inner surfaces of the inner surface means being insulated in relation to the external electrode; (b) a third terminal electrically connected to both of said electri-



cally conductive inner surfaces of the inner surface means; (c) a frustoconical male element of said centering means, formed on said first element and having the same axis of revolution as said internal electrode thereof; and (d) a frustoconical female element of said centering means, formed in said second element and having the same axis of revolution as the external electrode thereof, said male and female elements of said centering means having respective frustoconoical surfaces which are both electrically conductive and said third terminal comprising an electrical conductor connected to the conductive surfaces of said first element and a separate electrical conductor connected to the conductive surface of said second element whereby said conductive surfaces of said first and second elements may be connected to a potential ground, said first element having a base with said male element being formed on said base and insulating means being disposed between said internal electrode and said male element.

4,546,313

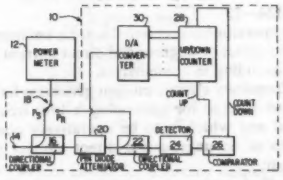
PEAK POWER RATIO GENERATOR

Robert D. Moyer, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 14, 1983, Ser. No. 474,997

Int. Cl.⁴ G01R *19/16, 21/04*

U.S. Cl. 324—103 P **16 Claims**



1. An electrical circuit for generating an output signal repre-

sentative of the peak power level of an input signal, said circuit comprising:

means for dividing the input signal into a first reference signal and a second source signal; and

circuit means for maintaining the peak power level of said reference at a predetermined peak power level, said circuit means including,

variable attenuator means for controlling the amplitude of said reference signal;

detector means for detecting when the peak level of the reference signal exceeds a predetermined value; and

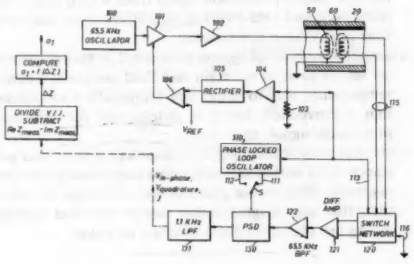
control means, responsive to said detector means, for controlling said variable attenuator means to increase the attenuation of said attenuation means when the peak level exceeds the predetermined value and to decrease the attenuation when the peak level is less than the predetermined value.

4,546,314

METHOD AND APPARATUS FOR MEASURING THE INSIDE DIAMETER OF A METALLIC PIPE IN A WELL

Gerald N. Minerbo, Missouri City, Tex., and R. Bruce McCann, Paris, France, assignors to Schlumberger Technology Corp., Houston, Tex.

Filed Dec. 13, 1982, Ser. No. 449,016
Int. Cl.⁴ G01N 27/72; G01B 7/12
U.S. Cl. 324—221 **17 Claims**



1. Apparatus for measuring the inside diameter of a metallic pipe in a well, comprising

a support member, adapted for displacement through the pipe,

transmitter means including a transmitter coil disposed on said support member for generating an a.c. transmitter current,

receiver means including a receiver coil disposed on said support member a distance from said transmitter coil for producing a receiver voltage in response to the effect of said transmitter current on the pipe, said voltage including a component in-phase with the transmitter current and a component in quadrature to the transmitter current,

means responsive to said receiver means and said transmitter means for deriving a signal ΔZ representative of the difference between the real and imaginary components of the impedance, defined as the ratio of the receiver voltage to the transmitter current, said real component being in phase with the transmitter current and said imaginary component being in quadrature to the transmitter current, and

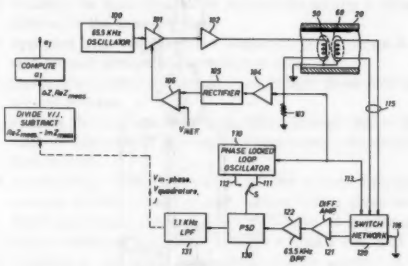
means for deriving a signal representative of the inside diameter of the pipe from said difference signal ΔZ, based on a predetermined relationship between the difference signal and the inside diameter.

4,546,315

APPARATUS FOR MEASURING THE INSIDE DIAMETER OF A METALLIC PIPE IN A WELL

Gerald N. Minerbo, Missouri City, and Gary A. Hazen, Houston, both of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Dec. 13, 1982, Ser. No. 449,015
Int. Cl.⁴ G01N 27/72; G01B 7/12
U.S. Cl. 324—221 **8 Claims**



1. Apparatus for measuring the inside diameter of a metallic pipe in a well, comprising

a support member, adapted for displacement through the pipe,

transmitter means including a transmitter coil disposed on said support member for generating an a.c. transmitter current,

receiver means including a receiver coil disposed on said support member a distance from said transmitter coil for producing a receiver voltage in response to the effect of said transmitter current on the pipe, said voltage including a component in-phase with the transmitter current and a component in quadrature to the transmitter current,

means responsive to said receiver means and said transmitter means for generating the real and imaginary components of the impedance, defined as the ratio of the receiver voltage to the transmitter current, said real component being in phase with the transmitter current and said imaginary component being in quadrature to the transmitter current, and

means for deriving a signal representative of the inside diameter of the pipe from said read and imaginary components by simultaneously solving two non-linear equations which respectively express those components as functions of a_1 and τ,

where a_1 represents the inside radius of the pipe, and τ is a factor proportional to the square root of the ratio of the permeability of the pipe to the conductivity of the pipe.

4,546,316

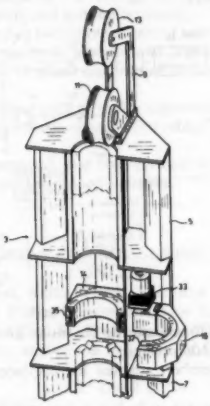
MAGNETIC TESTING DEVICE FOR SUPPORTED OBJECTS

John G. Lang, Scarborough, Canada, assignor to Rotesco Limited, Scarborough, Canada

Filed Jul. 2, 1982, Ser. No. 394,761
Int. Cl.⁴ G01N 27/83; G01R 33/02
U.S. Cl. 324—262 **11 Claims**

1. A testing device for magnetically testing while uninterruptedly moving along an elongated magnetically permeable stationary object having intermittent supports at one side thereof, said device being arranged to close around and test the object from all sides other than at the supports and being adapted to open at and clear past the supports while continuing to move, said device comprising a housing having a first major stationary housing section and a minor moveable housing section hingedly connected thereto, magnetic field sensors in each of said housing sections, means for maintaining said first housing section in a testing position while said second housing

section is moved relative to the object for opening and closing said device therearound, actuator means for effecting such opening and closing, control means for operation of said actuator means without manual assistance at the device, and magnetic field inducing means comprising strong permanent magnets spaced apart from one another and pole pieces for directing the magnetic field from said magnets into the object at said



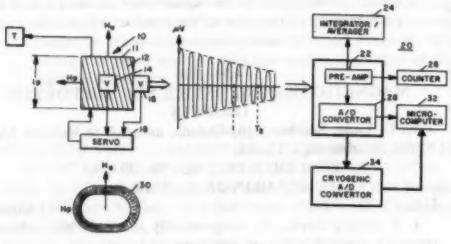
device, said magnetic field inducing means and pole pieces being confined to said first housing section; said second housing section being of a size to fit inwardly between said magnets on said first housing section free of magnetic attraction thereto for eliminating magnetic resistance to opening of said second housing section and being of a reduced weight relative to said first housing section for readily enabling closure of said second housing section by said actuator means.

4,546,317

FREE NUCLEAR PRECESSION GRADIOMETER SYSTEM

George F. Hinton, Bay St. Louis, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 1, 1983, Ser. No. 510,131
Int. Cl.[4] G01R *33/00*
U.S. Cl. 324—301 **5 Claims**



1. A gradiometer comprising:

a nuclear precession magnetometer sensor having a fluid sample containing nuclear species which display a magnetic moment, said sample comprising a low viscosity, high molecular weight hydrocarbon which includes protons as the nuclear specie;

means for stabilizing said magnetometer sensor with respect to the earth's magnetic field to reduce noise due to rotation and orientation, said means for stabilizing comprising a pair of vector magnetometers mounted rigidly on said magnetometer sensor orthogonal to each other and to the earth's magnetic field, and a servo system connected to said magnetometer sensor via a two-gimbal mount which continuously orients said magnetometer sensor to reduce the output of said pair of vector magnetometers to zero;

means for polarizing said fluid sample to produce a polarization field essentially transverse to the earth's magnetic field;

measuring means for measuring the frequency of an output precession signal from said magnetometer sensor over a precise time interval to determine the total field intensity of the earth's magnetic field, and for monitoring the amplitude variations of said output precession signal over said precise time interval to determine the total field gradient of the earth's magnetic field at essentially a point;

said measuring means comprising a frequency counter to determine the average frequency of said output precession signal over said precise time interval, said average frequency being a measure of said total field intensity, and an integrator to determine the average amplitude of said output precession signal over said precise time interval, said average amplitude being a measure of the total field gradient;

said measuring means further comprising a lock-on amplifier to lock onto said output precession signal, an analog to digital converter connected to receive its input from said lock-on amplifier and operable to convert said output precession signal to a computer compatible format, and a microcomputer operable to calculate from said computer compatible format a precise realtime Fourier Transform for said output precession signal from which said average frequency and said average amplitude over said precise time interval are determined;

a temperature control system connected to said magnetometer sensor so as to maintain said fluid sample at a constant temperature and to sense any temperature variations so that a correction factor is determined for said output precession signal; and

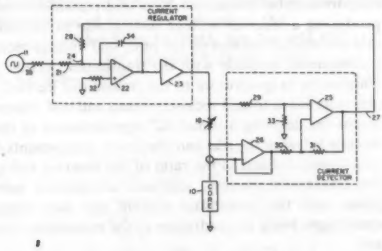
a toroidal noise-cancelling coil disposed to trap said polarization field within said coil while constraining the earth's magnetic field to the plane of the windings of said coil such that said magnetometer sensor and said stabilizing means are protected from external ac noise.

4,546,318

METHOD FOR REGULATING CURRENT FLOW THROUGH CORE SAMPLES

Edgar A. Bowden, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 11, 1983, Ser. No. 478,190
Int. Cl.[4] G01R *27/08*; G01N *27/04*; G01V *3/06*; G05F *1/12*
U.S. Cl. 324—376 **1 Claim**



1. A method for regulating current flow through a core sample having a non-linear response to such current flow due to electro-chemical reaction between the non-linear core sample and the current flow, comprising:

(a) supplying current flow having a sine wave characteristic to said non-linear core sample to be tested for its electrical impedance,

(b) connecting a resistance in series with said non-linear core sample,

(c) measuring the distorted sine wave characteristic of the current flow through said resistance and said non-linear core sample caused by said electro-chemical reaction,

(d) producing an analog signal representative of said distorted sine wave current flow,

(e) applying said current flow having a sine wave chracteristic to the inverting input of a summing amplifier, and

(f) applying said analog signal representative of the distorted sine wave current flow through said resistance and said non-linear core sample to the inverting input of said summing amplifier, said summing amplifier operating to regulate the current flow through said resistance and said non-linear core sample to be proportional to the sine wave characteristic of the current flow in the presence of said distortion caused by the electro-chemical reaction between said current flow and said non-linear core sample.

4,546,319

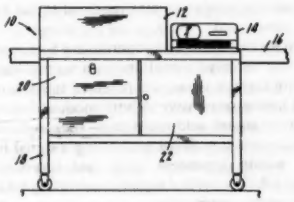
VACUUM TESTING METHOD AND APPARATUS

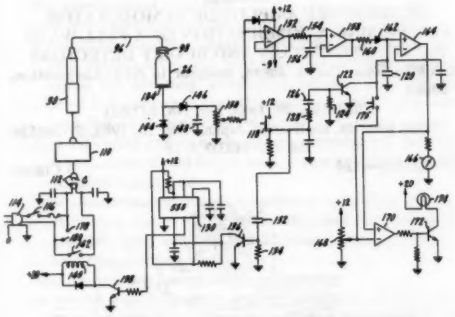
Ernest H. Pfaff, 1549 Woodvale Ave., Deerfield, Ill. 60015; Kenneth D. Mowbray, 726 S. Laurel, Des Planes, Ill. 60016, and David R. Pacholok, 437 North Crystal, Elgin, Ill. 60120

Filed Nov. 4, 1983, Ser. No. 548,656

Int. Cl.⁴ G01L *21/34*

U.S. Cl. 324—460 **20 Claims**





4. A continuous process for testing the degree of vacuum in a plurality of evacuated vials including at least two sequential tests at each of which a different portion of the vials are tested, comprising the steps of

a. selecting a particular quantity of vials for testing,

b. locating the selected vials in position for testing a first portion of the selected vials,

c. aplying high voltage radio frequency power to each of said first portion of the selected vials,

d. applying a momentary intense flash of light to each of said first portion,

e. sensing the ionization current of the ionized gas within each of said first portion and generating a representation thereof,

f. comparing the representation of the sensed ionization current of each of said first portion with a given minimum acceptable current value indicative of a predetermined minimum allowable vacuum within a vial,

g. locating the selected vials in position for testing a second portion of the selected vials,

h. applying high voltage radio frequency power to each of said second portion of the selected vials,

i. applying a momentary intense flash of light to each of said second portion,

j. sensing the ionization current of the ionized gas within each of said second portion and generating a representation thereof,

k. comparing the representation of the sensed ionization current of each of said second portion with a given minimum acceptable current value indicative of a predetermined minimum allowable vacuum within a vial, and

l. rejecting a vial if the measured ionization current of the vial is less than the minimum acceptable current value.

4,546,320

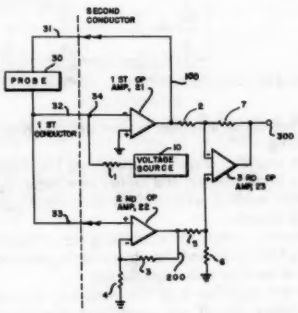
TOTAL TEMPERATURE PROBE BUFFER AMPLIFIER

William E. Ott, San Pedro, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 16, 1984, Ser. No. 580,979

Int. Cl.⁴ G01K *7/18*

U.S. Cl. 328—3 **1 Claim**



1. In combination with a critical element that generates an electrical signal in response to stimuli and that has an input and output and a electrical resistance therebetween, a buffer amplifier circuit comprising,

first, second and third operational amplifiers, each having a negative input, a positive input and an output,

first and second electrical conductors having substantially equal resistance values,

a voltage source, and

first, second, third, fourth, fifth, sixth and seventh resistors,

said first electrical conductor connecting the input of said critical element to the negative input of said first operational amplifier, said second electrical conductor connecting the output of said critical element to the output of said first operational amplifier,

said voltage source connected to the negative input of said first operational amplifier thriug said first resistor,

said second and seventh resistors connected in series between the outputs of said first and third operational amplifiers, the negative input of said third operational amplifier

connected to the junction of said second and seventh resistors,

the positive input of said third operational amplifier being connected to ground through said sixth resistor, to the output of said second operational amplifier through said fifth resistor, and to the negative input of said second operational amplifier through the same conbination of said fifth and third resistors,

said second operational amplifier having its positive input connected to the input of said critical element and its negative input connected to ground through said fourth resistor.

4,546,321

NON-LINEAR AMPLIFIER SYSTEMS FOR REPETITIVE SIGNALS

Glenn Bateman, and Richard E. DuPuy, Jr., both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

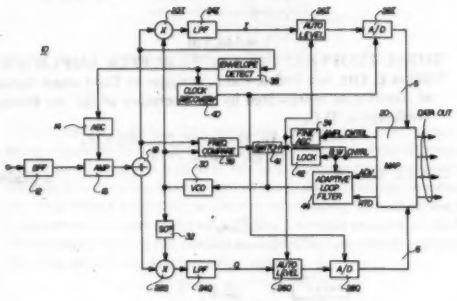
PCT No. PCT/US82/01747, § 371 Date Jun. 13, 1983, § 102(e) Date Jun. 13, 1983, PCT Pub. No. WO83/02371, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 16, 1982, Ser. No. 509,467

Claims priority, application Japan, Dec. 28, 1981, 56-2159881

Int. Cl.⁴ G06G *7/12*

U.S. Cl. 328—142 **5 Claims**



1. A non-linear amplifier system for a repetitive input signal, comprising:

a first amplifier stage for amplifying low level input signals in a linear manner and higher level input signals in a non-linear manner, whereby low level noise signals are amplified linearly;

a sampling circuit for smoothing the output from said first amplifier stage and thereby reducing the amplitude of low level random noise signals; and

a second amplifier stage for receiving the output from the sampling circuit and amplifying in a non-linear manner signals corresponding to low level input signals of the first amplifier stage and amplifying in linear manner signals correspondjng to higher level input signals of the first amplifier stage, whereby low level input signals can be amplified in non-linear manner without introducing substantial errors due to non-linear amplification of low level random noise signals.

4,546,322

ADAPTABLE DEMODULATOR FOR ARBITRARY AMPLITUDE AND PHASE KEYED MODULATION SIGNALS

W. Larkin Crutcher, Richardson, Tex., assignor to Reliance Electric Company, Cleveland, Ohio

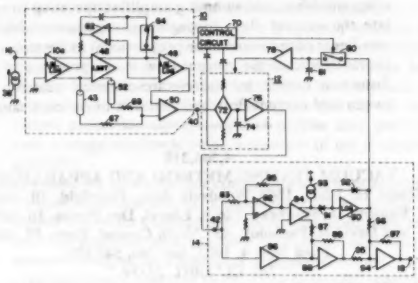
Filed Aug. 24, 1983, Ser. No. 526,119

Int. Cl.⁴ H04L *27/20, 27/22*

U.S. Cl. 329—50 **27 Claims**

1. A demodulator for demodulating data from a received signal which comprises a carrier signal modulated, in accordance with a selected one of a multiplicity of amplitude and phase keyed modulation schemes, by input binary data having a clock associated therewith, said selected scheme giving rise to a multiplicity of signals representative to said input binary data, said demodulator demodulating said input binary data from said received signal by first capturing said received signal and then by maintaining capture when said received signal is captured, said demodulator comprising:

(a) storage means having stored therein a multiplicity of addressable words each containing information, said information providing at the output of said storage means when one of said words is addressed signals for controlling demodulation of said received signal and said data, said information being uniquely determined by said multiplicity of signals representative of said input binary data;



(b) means responsive to said received signal for recovering said clock; and

(c) loop means arranged to operate in a first mode for capturing said received signal and in a second mode for maintaining capture when said received signal is captured, said loop means responsive in both modes of operation to said received signal, said recovered clock and said demodulation control signals for generating a signal for addressing said words dependent upon said received signal, said demodulation control signals controlling which mode said loop means operates in.

4,546,323

QUADRATURE AMPLITUDE DEMODULATOR COMPRISING A COMBINATION OF A FULL-WAVE RECTIFYING CIRCUIT AND BINARY DETECTORS

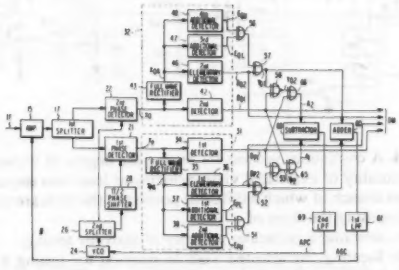
Toshihiko Ryu, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 29, 1983, Ser. No. 527,621

Claims priority, application Japan, Aug. 28, 1982, 57-148526

Int. Cl.⁴ H03D *3/18*

U.S. Cl. 329—124 **5 Claims**



1. In a demodulator for demodulating a gain controlled

signal having a first and a second phase component into demodulated signals, said first and said second phase components having a quadrature phase difference relative to each other and a first and a second input level, respectively, said demodulator comprising:

a gain controllable amplifier responsive to an automatic gain control signal for gain-controlling a demodulator input signal to produce said gain controlled signal with said first and said second input levels given a first and a second one of first through k/2-th and (k/2+1)-th through k-th successively descending levels at a time, respectively, where k is equal to 2^N where, in turn, N represents an integer greater than unity, said first through said k/2-th levels being symmetric to said k-th through said (k/2+1)-th levels on both sides of a median level;

coherent detecting means responsive to an automatic phase control signal for detecting said first and said second phase components to produce first and second detection signals, respectively, said first detection signal having a first detection level corresponding to said first input level, said second detection signal having a second detection level corresponding to said first input level;

first processing means for processing said first detection signal to produce a first set of binary signals and a first additional binary signal, said first set being representative of said first detection level and comprising a first most significant bit signal and at least one first less significant bit signal;

second processing means for processing said second detection signal to produce a second set of binary signals and a second additional binary signal, said second set being representative of said second detection level and comprising a second most significant bit signal and at least one second less significant bit signal;

output producing means for producing said first and said second sets as said demodulated signals;

gain control signal producing means responsive to at least one of a combination of said first set and said first additional binary signal and another combination of said second set and said second additional binary signal for producing said automatic gain control signal; and

phase control signal producing means responsive to said first and said second sets and said first and said second additional binary signals for producing said automatic phase control signal;

the improvement wherein:

said first processing means comprises:

a first binary detector having a first reference level equal to said median level and responsive to said first detection signal for detecting whether or not said first detection level is higher than said first reference level to produce said first most significant bit signal;

first full-wave rectifying means for carrying out full-wave rectification of said first detection signal to produce a first rectified signal; and

first discriminating means coupled to said first full-wave rectifying means for discriminating said first less significant bit signal and said first additional binary signal from said first rectified signal;

said second processing means comprising:

a second binary detector having a second reference level equal to said first reference level and responsive to said second detection signal for detecting whether or not said second detection level is higher than said second reference level to produce said second most significant bit signal;

second full-wave rectifying means for carrying out full-wave rectification of said second detection signal to produce a second full-wave rectified signal; and

second discriminating means coupled to said second full-wave rectifying means for discriminating said second less significant bit signal and said second additional binary signal from said second rectified signal.

4,546,324

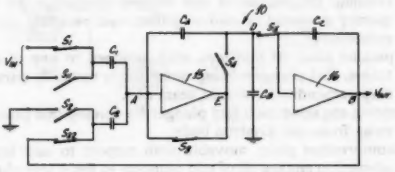
DIGITALLY SWITCHED ANALOG SIGNAL CONDITIONER

David Bingham, San Jose; Lee L. Evans, Atherton, and Peter D. Bradshaw, Sunnyvale, all of Calif., assignors to Intersil, Inc., Cupertino, Calif.

Filed Dec. 27, 1982, Ser. No. 453,237

Int. Cl.⁴ H03F *1/34*

U.S. Cl. 330—9 **9 Claims**



1. A signal conditioning circuit comprising:

and least one pair of input terminals for first and second input signals, respectively;

amplification means for amplifying an input signal, said amplification means having an input node and also having an output for an output signal;

a plurality of charge storing members coupled to said input node of said amplification means;

means for alternatively coupling the input terminals via one of said charge storing members to said input node of said amplification means; and

means for alternatively feeding back the output of said amplification means and a reference signal via a second one of said charge storing members to said input node of said amplification means.

4,546,325

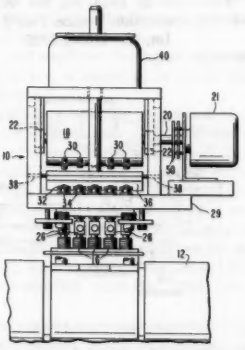
FAST-ACTING TUNER FOR MULTIPLE-CHANNEL KLYSTRONS

Carol J. Thiem, Mountain View; Gordon R. Lavering, Belmont, and Gerald A. Valier, Los Altos, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Sep. 28, 1984, Ser. No. 655,842

Int. Cl.⁴ H03F *3/56;* **H03B** *27/00;* **H01J** *25/10*

U.S. Cl. 330—45 **4 Claims**



1. A multicavity klystron amplifier comprising:

a vacuum-tight klystron body,

a gun for generating a linear beam of electrons,

a plurality of resonant cavities arrayed sequentially along the axis of said beam,

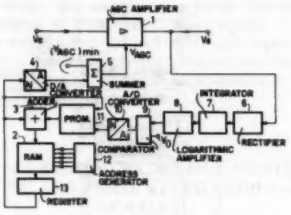
a collector for catching said beam downstream of said cavities,
passageways for conducting said beam through said cavities into said collector,
a transmission line for introducing an input signal into a first of said cavities,
a transmission line for extracting an amplified output signal from a last of said cavities,
a movable tuner member in each of said cavities,
means for remotely controlled, simultaneous resetting of the resonant frequencies of said cavities to change the frequency passband of said amplifier, said resetting means comprising:
a parallel array of plungers, each attached to one of said tuners, said plungers being movable on mutually parallel axes perpendicular to said beam axis,
a spring engaging each said plunger for forcing said plunger away from said klystron body,
a compression plate, movable with respect to said body, adapted to engage all of said plungers to force said plungers toward said body,
a linear actuator adapted to force said compression plate toward said body,
a cam carrier rigidly mounted with respect to said body, but rotatable about a cam carrier axis perpendicularly intersecting the axes of motion of said plungers,
a plurality of rows of cams, each row aligned parallel to said cam carrier axis and spaced such that when said row is rotated into the plane of said plungers, one cam of each set is aligned to contact one of said plungers,
each of said cams being adjustable in its extent from said cam carrier axis,
a stepwise actuator for rotating said cam carrier to bring different sets of cams onto said axis of cam follower motion,
control means for said frequency resetting, including means for controlling the steps of:
energizing said linear actuator to force said plungers away from said cams,
energizing said stepwise actuator to rotate a desired set of cams into said axis of said plungers,
de-energizing said linear actuator whereby said springs force said plungers into contact with said desired cams.

4,546,326

FAST AUTOMATIC GAIN CONTROL ARRANGEMENT

Jean-Pierre H. Van Uffelen, Chevilly Larue; Daniel Robillard, Elancourt, and Michel LeBourg, Clamart, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,718
Claims priority, application France, Feb. 3, 1982, 82 01722
Int. Cl.[4] H03G *3/20*
U.S. Cl. 330—129 **4 Claims**



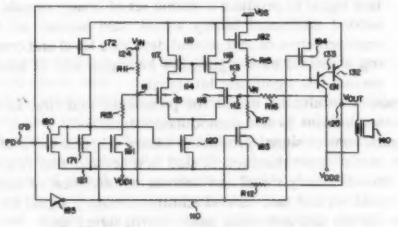
1. A fast automatic gain control arrangement for use in an intermediate frequency portion of a radio-frequency receiver which receives data from multiple transmission channels with frequent channel change, the arrangement comprising:
an amplifier having an imput signal terminal, an output signal terminal, and a control signal terminal;
means for storing a digital control signal, the digital control signal depending upon the frequency of an input signal present at the input terminal, the storing means having an output connected to the control signal terminal of the amplifier and also having a corrected digital control signal input;
means for measuring an output signal present at the output signal terminal and producing a digital correction signal which depends upon the output signal;
means for producing a readjusted digital correction signal which depends upon the digital control signal and also upon the digital correction signal, the readjusted digital correction signal producing means having an output, and
means for adding the digital control signal and the readjusted digital correction signal and producing a corrected digital control signal at an output of the adding means, the output of the adding means being connected to the corrected digital control signal input of the storing means.

4,546,327

ANALOG SIGNAL POWER AMPLIFIER CIRCUIT

Yasoji Suzuki, Yokosuka; Itsuo Sasaki, and Shouji Abou, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 13, 1983, Ser. No. 513,308
Claims priority, application Japan, Jul. 14, 1982, 57-122482
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **3 Claims**



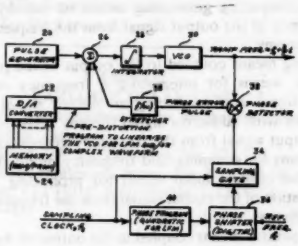
2. A power amplifier circuit for amplifying an analog signal comprising:
a signal input terminal for receiving an analog input signal;
a signal output terminal for producing an analog output signal;
a first power source for supplying a ground voltage;
a second power source;
a third power source;
first and second resistors series-connected between said first and third power sources so as to obtain a reference voltage signal at a common node between said first and second resistors;
a MOS differential amplifier having two input terminals and one output termina!, one of said two input terminals of said MOS differential amplifier receiving a signal corresponding to the analog input signal received at said signal input terminal, and the other of said two input terminals receiving the reference voltage signal;
a bipolar transistor driven by a signal from said output terminal of said MOS differential amplifier, one end of the collector-emitter path of said bipolar transistor connected to said first power source and the other end thereof connected to said signal output terminal;
load means one end of which is connected to said signal output terminal and the other end of which is connected to said third power source; and
a third resistor inserted between said second power source and a common node between said first and second resistors so as to regulate a DC voltage at said signal output terminal.

4,546,328

PLL SWEPT FREQUENCY GENERATOR WITH PROGRAMMABLE SWEEP RATE

Edwin B. Smith, Kwajalein Atoll, Trust Ter. Pacific Isl., and John R. Fogleboch, Sr., Cherry Hill, N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 23, 1983, Ser. No. 497,447
Int. Cl.⁴ H03L *7/08*
U.S. Cl. 331—4 **7 Claims**



1. A phase-locked voltage controlled oscillator apparatus comprising in combination:

means for generating a waveform, said waveform generating means providing an output signal,

a means for summing to receive said output signal from said waveform generating means, said summing means summing said output signal with an error signal to provide a voltage signal.

a voltage-controlled oscillator receiving said voltage signal from said summing means, said voltage-controlled oscillator providing a frequency output in response to said voltage signal, and,

a phase-locked loop connected between the output of said voltage-controlled oscillator and said summing means, said phase-locked loop receiving said frequency output and a reference frequency, said phase-locked loop receiving a sampling frequency, said phase-locked loop sampling the phase difference between said frequency output and said reference frequency at the rate of said sampling frequency and generating a phase error signal proportional to said phase difference to correct said frequency output at said rate of said sampling frequency during the generation of said waveform therebetween.

4,546,329

FREQUENCY SYNTHESIZERS ADAPTIVE LOOP FILTER WITH COMPENSATION FOR TRANSIENTS

John D. Unger, Barrington, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

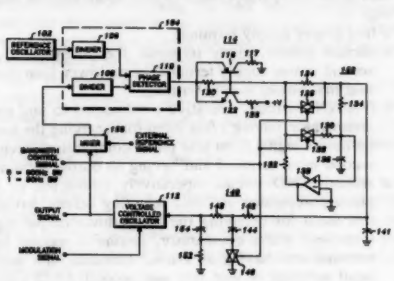
Filed Sep. 27, 1982, Ser. No. 424,816
Int. Cl.⁴ H03L *7/06*
U.S. Cl. 331—16 **12 Claims**

9. A loop filter for frequency synthesizing means, said frequency synthesizing means including a signal source for generating a reference signal, phase detecting means coupled to the reference signal and to a first feedback signal for generating an error signal, voltage-controlled oscillating (VCO) means coupled to the loop filter, and dividing means coupled to the VCO means for providing the first feedback signal, said loop filter comprising:

current limiting means coupled to the error signal from the phase detecting means for generating a current-limited output signal;

filtering means coupled to receive the current limiting means output signal and including a series-coupled first resistive means and capacitive means, for filtering the current limiting means output signal to provide a steering signal, the steering signal being coupled to the VCO means;

amplifying means coupled to receive the output of the capacitive means for generating a second feedback signal; and



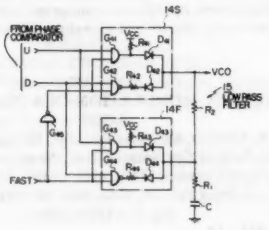
second resistive means coupling the second feedback signal to the current limiting means output signal for substantially reducing the duration of transients on the current limiting means output signal.

4,546,330

PHASE-LOCKED LOOP CIRCUIT

Toshiro Okada, Machida, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 28, 1983, Ser. No. 462,112
Claims priority, application Japan, Jan. 28, 1982, 57-12116
Int. Cl.⁴ H03L *7/00*
U.S. Cl. 331—17 **4 Claims**



1. A phase-locked loop circuit operatively connected to receive an input signal and operatively connected to a constant voltage source, comprising:

a voltage-controlled oscillator having an input terminal and generating, at an output terminal, an output signal having an output frequency;

a phase comparator, operatively connected to the output terminal of said voltage-controlled oscillator and operatively connected to receive the input signal, for generating a pump-up output signal or a pump-down output signal in dependence upon whether the input signal leads or lags the output signal of said voltage-controlled oscillator;

a low-pass filter, operatively connected to said input terminal of said voltage-controlled oscillator, for generating a control voltage for controlling the output frequency of said voltage-controlled oscillator, said low-pass filter comprising:

a capacitor having one terminal connected to ground; and

a plurality of resistors operatively connected in series between the other terminal of said capacitor and said input terminal of said voltage-controlled oscillator;

a plurality of pump circuits, each operatively connected to said phase comparator and to one of said plurality of resistors of said low-pass filter, for charging or discharging said capacitor in said low-pass filter through the con-

stant voltage source upon receipt of the pump-up output signal or the pump-down output signal, respectively, from said phase comparator, each of said pump circuits including:

a first power supply terminal;

a second power supply terminal, the potential of said second power supply terminal being lower than that of said first power supply terminal;

a first AND circuit, operatively connected to said phase comparator, having a first input for receiving the pump-up output signal from said phase comparator, having a second input terminal and having an output terminal;

a second AND circuit, operatively connected to said phase comparator and said selecting means, having a first input for receiving the pump-down output signal from said phase comparator, having a second input terminal and having an output terminal, said second input terminal of said first and second AND circuits being commonly controlled by said selecting means;

a first tri-state circuit having an input terminal operatively connected to said first power supply terminal, having a control terminal operatively connected to said output terminal of said first AND circuit, and having an output terminal;

a second tri-state circuit having an input terminal operatively connected to said second power supply terminal, having a control terminal operatively connected to said output terminal of said second AND circuit, and having an output terminal;

a first resistor operatively connected to said output terminal of said first tri-state circuit; and

a second resistor operatively connected to said output terminal of said second tri-state circuit, said first and second resistors being commonly connected to one of said plurality of resistors of said low-pass filter; and

selecting means, operatively connected to said pump circuits for selecting one of said plurality of pump circuits.

4,546,331

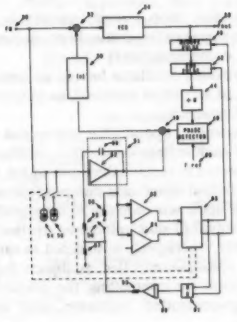
FREQUENCY MODULATION IN A PHASE-LOCKED LOOP

Marcus K. DaSilva, Spokane; David P. Whipple, and Robert E. Temple, both of Greenacres, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 21, 1984, Ser. No. 581,767

Int. Cl.[4] **H03C** *3/00*

U.S. Cl. 332—19 **9 Claims**



5. An electronic apparatus for frequency modulation of a multiplicity of frequencies which are desired rational multiples of a reference frequency generated in a phase-locked loop, said apparatus comprising:

frequency generating means for producing an output signal with frequency responsive to the level of a control input signal;

first counting means responsive to the output of the frequency generating means for producing an output signal with a frequency equal to the frequency of a signal at the input of the first counting means divided by a predetermined divisor N;

phase comparison means coupled to the first counting means for comparing the phases of the output signal from the first counting means and the reference signal and generating an error signal indicative of a phase difference therebetween, said error signal serving as the control input signal to the frequency generating means to thereby vary the frequency of the output signal from the frequency generating means;

integrating means coupled to the output of the phase comparison means for integrating a frequency modulation input signal and producing an output signal which is summed with said error signal thereby phase modulating the output signal from the frequency generating means;

input means for summing said frequency modulation signal with the control input signal for producing frequency modulation of the output signal from the frequency generating means;

first comparator means coupled to the output of the integrating means for comparing the output of the integrating means to a predetermined arbitrary first voltage level for producing a high threshold pulse whenever the output of the integrating means exceeds said first voltage level;

second comparator means coupled to the output of the integrating means for comparing the output of the integrating means to a predetermined arbitrary second voltage level, said first voltage level greater than said second voltage level for producing a low threshold pulse whenever the output of the integrating means is less than said second voltage level;

cycle removal means interconnected between the frequency generating means and the first counting means, said cycle removal means responsive to the high threshold pulse to remove at least one cycle from the input of the first counting means thereby removing a multiple of two pi radians of accumulated phase shift from the input signal to the first counting means;

cycle addition means interconnected between the frequency generating means and the first counting means, said cycle addition means responsive to the low threshold pulse to add at least one cycle to the input of the first counting means for adding a multiple of two pi radians of accumulated phase shift to the input signal to the counting means;

first current generating means coupled to the input of the integrating means responsive to the high threshold pulse for inputting a reset current into the integrating means input to reset the output of the integrating means a predetermined amount below said predetermined first voltage level, said predetermined amount cancelling exactly said multiple of two pi radians of phase shift removed from the input signal to the first counting means; and

second current generating means coupled to the input of the integrating means responsive to the low threshold pulse for inputting a reset current into the integrating means input to reset the output of the integrating means a predetermined amount above said predetermined second voltage level, said predetermined amount cancelling exactly said multiple of two pi radians of phase shift added to the input signal to the first counting means;

second counting means responsive to the high threshold pulses and the low threshold pulses for producing a digital signal indicative of the net number of cycles added to and removed from the input to the first counting means;

digital-to-analog converter means coupled to the second counting means and responsive to said digital signal for producing a voltage signal proportional to the net number of cycles removed from and added to the input of the first counting means;

resistive feedback means coupled to the output of the integrating means and the output of the digital-to-analog converter means and to the input of the integrating means,

said resistive feedback means responsive to the output of the integrating means and the output of the digital-to-analog means for producing a feedback current to the input of the integrating means, said feedback current proportional to the amount of phase that the output of the frequency generating means is away from the center frequency of the output of the frequency generating means; and

switching means disposed between the resistive feedback means and the input of the integrating means for interrupting said feedback current path.

4,546,332

VARIABLE DELAY LINE

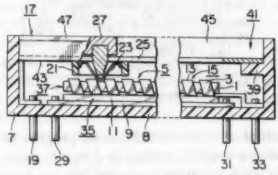
Kazuo Kameya, Tsurugashima, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Jan. 25, 1984, Ser. No. 573,746

Claims priority, application Japan, Jan. 27, 1983, 58-10396[U]

Int. Cl.⁴ H01P *9/00;* **H03H** *7/32, 7/34*

U.S. Cl. 333—139 **10 Claims**



1. A variable delay line, comprising; an inductance element formed of a conductor, capacitor means arranged in conjunction with said inductance element to form an electromagnetic delay line, a conductive plate disposed along said delay line and facing one surface of said delay line, a fixed contact row comprising a plurality of fixed contacts formed on said conductor at positions facing said conductive plate, and a movable contact adapted to be movable along said fixed contact row so as to successively contact said fixed contacts of said row while maintaining continuous contact with said conductive plate, said conductive plate having a first portion substantially spaced from said inductive element, at least one bent portion extending from said first portion toward said inductance element, and at least one portion in contact with said movable contact and having a relatively smaller spacing from said inductive element.

4,546,333

DIELECTRIC FILTER

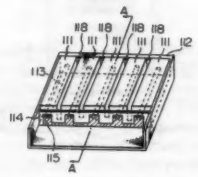
Atsushi Fukasawa; Kenichiro Hosoda; Takuro Sato, and Tatumasa Yoshida, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,881

Claims priority, application Japan, May 10, 1982, 57-76565; May 10, 1982, 57-76566

Int. Cl.⁴ H01P *1/207, 1/205*

U.S. Cl. 333—202 **14 Claims**



1. A dielectric filter comprising;

(a) a conductive closed housing,

(b) at least two resonators fixed in said housing,

(c) input means for coupling one end resonator of said at least two resonators to an external circuit, and output means for coupling the other end resonator of said at least two resonators to an external circuit,

(d) each resonator comprising an elongated linear inner conductor one end of which is fixed commonly at the bottom of said housing, and the other end of which is free standing with respect to the housing, and a dielectric body surrounding the inner conductors,

(e) the thickness of said dielectric body surrounding said inner conductor being sufficient to hold all the electromagnetic energy in the dielectric body except for the energy for coupling between two adjacent resonators, and

(f) an air gap is provided between adjacent resonators; characterized in that

(g) said dielectric body surrounding the inner conductors is a bulk body common to all the resonators with a groove between two adjacent resonators which groove extends parallel to the conductors, and said groove operates as said air gap between resonators for effecting coupling between the resonators,

(h) a capacitor with a stationary trimming electrode is provided at the free standing end of the inner conductor of each resonator for finely adjusting the resonating frequency of the resonator, and

(i) said capacitor having an opaque dielectric plate and a pair of electrodes attached on both the surfaces of said dielectric plate, one electrode is electrically coupled with an inner conductor of a resonator, and another electrode is grounded to the housing, and said latter electrode is adapted for trimming by a laser beam for adjusting the capacitance of the capacitor.

4,546,334

ELECTRICAL FILTER DEVICE

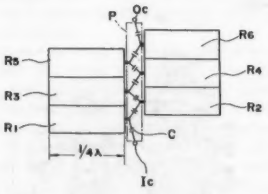
Toshio Nishikawa, Nagaokakyo; Youhei Ishikawa, Kyoto, and Tadahiro Yorita, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Apr. 21, 1983, Ser. No. 487,095

Claims priority, application Japan, Apr. 24, 1982, 57-70154; Jun. 8, 1982, 57-98875; Jul. 7, 1982, 57-118890; Oct. 20, 1982, 57-184976; Nov. 4, 1982, 57-194170; Jan. 6, 1983, 58-506[U]

Int. Cl.⁴ H01P *1/202, 1/205*

U.S. Cl. 333—206 **8 Claims**



1. An electrical filter device, comprising:

first and second groups of dielectric coaxial resonators, each said group including a plurality of resonators, each said resonator including a cylindrical coaxial member having coaxial inner and outer surfaces and inner and outer conductors formed on said inner and outer surfaces, respectively;

each resonator of said first group being adjacent at least one other resonator of said first group and having at open end face which is approximately located in a first common imaginary plane;

each resonator of said second group being adjacent at least one other resonator of said second group and having an open end face which is approximately located in a second common imaginary plane spaced from and generally par-

allel to said first imaginary plane to define a signal propagation passage therebetween with said open faces of each of said resonators facing said signal propagation passage, said first and second groups of resonators at least partially overlapping one another;

the dimensions of said signal propagation passage being sufficient to ensure that there is substantially no electronic coupling between said resonators through said signal propagation passage; and

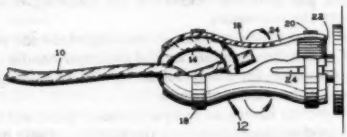
capacitor means located in said signal propagation passage for capacitively coupling all of said resonators together.

4,546,335

MANUAL REMOTE SOUND CONTROL FOR TV AND RADIO AND HIGH FIDELITY

Lawrence Wise, 4330 Hillcrest Dr., Apt. 804, Hollywood, Fla. 33021

Filed Oct. 5, 1983, Ser. No. 539,267
Int. Cl.⁴ H03J *9/00*; H04B *1/06*; H04N *5/44*
U.S. Cl. 334—8 **3 Claims**



1. A remote manual control for a continuous rotary knob for volume control or continuous tuning of a television, radio or high fidelity set or the like comprising:

a braided flexible cord stiffened with a stiffening substance; and

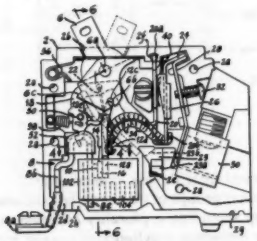
a flexible tube attached to one end of said cord for connecting said cord to said knob and for permitting said cord to be turned to rotate said knob, said cord having a knot received in said tube.

4,546,336

RESIDENTIAL CIRCUIT BREAKER WITH COMBINATION SLOT MOTOR AND ARC CHUTE

Dennis J. Petrie, Milwaukee, and Jerome K. Hastings, Sussex, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 2, 1983, Ser. No. 528,944
Int. Cl.⁴ H01H *77/10*
U.S. Cl. 335—16 **14 Claims**



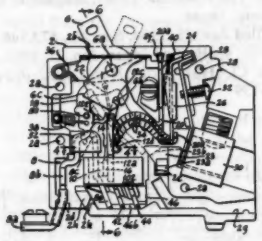
1. A residential circuit breaker having a narrow case of width less than or equal to about 1 inch, and having a pair of separable contacts mounted on respective current carrying conductors, and comprising a combination slot motor and arc chute mounted within said case and around both said conductors, wherein said combination slot motor and arc chute comprises a U-shaped member receiving both said conductors therein from one face side between the legs of the U, and having a plurality of electrically insulated arc plates on the other face side extending laterally between the legs of the U, one of said conductors being movable toward the open end of the U away from the bight of the U.

4,546,337

RESIDENTIAL CIRCUIT BREAKER WITH ONE PIECE SLOT MOTOR

Dennis J. Petrie, Milwaukee; Robert B. Bridges, Elm Grove; William E. Grass, Whitefish Bay, and Jerome K. Hastings, Sussex, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 2, 1983, Ser. No. 528,945
Int. Cl.⁴ H01H *77/10*
U.S. Cl. 335—16 **7 Claims**



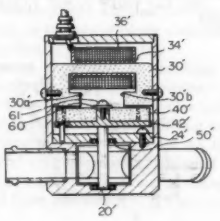
1. A residential or commercial circuit breaker of the narrow case type having a width less than or equal to about 1 inch, and having a pair of separable contacts mounted on respective current carrying conductors, and comprising a one-piece slot motor mounted within said case and comprising a unitary nonlaminated U-shaped member around both conductors and receiving both said conductors therein from one side, one of said conductors being movable toward the open end of the U away from the bight of the U upon separation of said contacts, said case having an end wall through which an operating handle extends, said contacts engaging along a plane substantially perpendicular to said handle end wall, said bight of said U-shaped member extending substantially parallel to said plane of contact engagement and substantially perpendicular to said handle end wall.

4,546,338

ROTARY DRIVING APPARATUS

Takaharu Idogaki, Okazaki; Hisasi Kawai, Toyohashi; Tooru Kosuda, Okazaki; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 26, 1982, Ser. No. 382,119
Claims priority, application Japan, Jun. 2, 1981, 56-83751
Int. Cl.⁴ H01F *7/08*; F16K *31/04*
U.S. Cl. 335—229 **7 Claims**



1. A rotary driving apparatus comprising:

a housing;

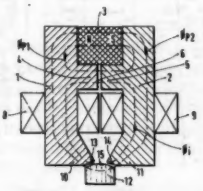
a rotor arranged in the housing;
a shaft connected to the rotor;
supporting means for rotatably connecting the shaft to the housing;
a permanent magnet member;
a first plate member extending transversely with respect to the shaft and fixedly connected to the shaft at an end remote from the rotor, said permanent magnet member being mounted on one side of the plate member remote from the rotor, said permanent magnet member being provided with axially superimposed two disk portions magnetized in mirror fashion along a common diametric line;
stopper means for allowing limited rotation of the rotor between first and second positions which are angularly spaced from each other at an angle smaller than 180°, said stopper means comprising a second plate member fixedly connected to said housing so as to axially and spacedly face with the other side of said first plate member remote from said magnet member and abutting means arranged between said first and said second plate members for effecting a movement of said first member with respect to said second member in said limited angle range;
a core made of magnetic material stationarily arranged on one side of the permanent magnet member remote from the rotor, said core being provided with a pair of diametrically spaced end portions located adjacent to the poles to the permanent magnet in a side-by-side relationship; and
coil means on the core for magnetizing, when energized, the portions of the core to become different poles so as to generate a torque for obtaining rotation of the permanent magnet in a desired direction of accordance with the direction of the electric current to be applied to the coil means in order to change-over the rotor between the first and the second positions;
said permanent magnet member beng so arranged with respect to the portions of the core so that a residual torque is generated in the permanent magnet member during the de-energization of the coil means for engaging the stopper means to maintain the selected one position of the rotor.

4,546,339

POLE STRUCTURE FOR A POLARIZED ELECTROMAGNET

Hans Kubach, Korntal-Münchingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 22, 1984, Ser. No. 643,230
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1983, 3336011
Int. Cl.⁴ H01F *7/08*
U.S. Cl. 335—230 **5 Claims**



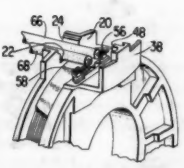
1. An electromagnet, in particular for controlling a fuel injection valve for fuel injection systems for internal combustion engines, having an armature and a core of soft magnetic material, characterized in that said core comprises a first pole piece disposed at one side of a first permanent magnet and arranged to support a first magnet coil and a second pole piece disposed at an opposite side of the first permanent magnet and arranged to support a second magnet coil, said first pole piece including a first pole having a concave surface oriented toward the armature and a first conduction section bent at an angle thereto, said second pole piece including a second pole having a concave surface oriented toward the armature and a second conduction section bent at an angle thereto, said first and second conduction sections being disposed between said first and second magnet coils and said first permanent magnet in opposed relation so as to define a gap therebetween, said first and second magnet coils are disposed on said pole pieces between said first and second poles and said first and second conduction sections, and said armature is provided with a convex surface on a portion thereof proximate to said concave surfaces on said first and second poles.

4,546,340

ELECTRICAL COIL ASSEMBLY

George F. Kuchuris, Bloomingdale, Ill., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 30, 1984, Ser. No. 635,689
Int. Cl.⁴ H01F *15/10*
U.S. Cl. 336—192 **11 Claims**



1. An electrical coil assembly comprising:
a bobbin having a coil receiving central portion and a pair of generally parallel end plates at either end of the central portion defining a coil receiving channel;
a wall integral with an edge of a first of said end plates and extending outwardly from said first end plate generally coplanar therewith, said wall being formed with a notch and a generally U-shaped channel aligned with said notch and extending axially outward from said wall;
a pair of terminals mounted on an end plate of said end plates;
a coil wound on the central portion of said bobbin within said channel and having a first end connected to a first of said terminals and a second end connected to the other of said terminals;
a pair of insulated lead wires each connected to a respective terminal and extending through said notch and said U-shaped channel; and
a cover member mounted on the second of said end plates across said coil receiving channel from said wall and spanning said coil receiving channel to cover said terminals and mate with said notch and said U-shaped channel outwardly from said lead wires ,said cover member being formed of one-piece construction with said second end plate and connected thereto by a thin web of material forming a living hinge and being further formed with a rib extending between said lead wires in said notch and said U-shaped channel, said cover member being secured to said wall to close said notch and said U-shaped channel.

4,546,341

ELECTRICAL CUTOUT HAVING A LINKBREAK LEVER

Delmar E. McNaghten; Dennis C. Kent, and Robert A. Brown, all of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Jun. 12, 1984, Ser. No. 619,836
Int. Cl.⁴ H01H *71/20*
U.S. Cl. 337—177 **18 Claims**

1. An electrical cutout electrically connected in series between a line terminal and a load terminal, said cutout comprising in combination:

an insulator having a first and a second end;

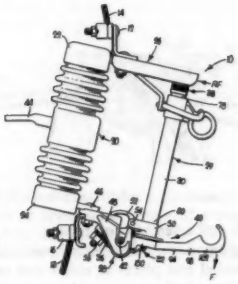
a first electrical conductor rigidly secured to said insulator adjacent said first end of said insulator, said first conductor being electrically connected to the line terminal;

a second electrical conductor rigidly secured to said insulator adjacent said second end of said insulator, said second conductor being electrically connected to the load terminal;

a fuse tube extending between said first and said second conductors;

a fuse link extending through said fuse tube, said fuse link including a first and a second end, said second end of said fuse link being electrically connected to said second electrical conductor;

cap means disposed adjacent said first end of said fuse link, said cap means being electrically connected to said first end of said fuse link, said cap means frictionally enaging said first conductor and being normally retained in said



frictional engagement, there being a moment which results from said retention force between said first conductor and said cap means; and

an elongated linkbreak lever means pivotally connected to said second conductor for swinging movement in an upright plane,

said lever means extending outwardly from said second conductor in a direction generally away from said insulator,

the longitudinal axis of said lever means lying normally in a generally horizontal plane,

said lever means being operable to break said fuse link as said lever means is moved downwardly, such that the force required to break said fuse link creates a moment less than said moment resulting from said retention force between said first conductor and said cap means to cause said cap means to be retained by said first conductor in frictional engagement with said first conductor as said fuse link is broken.

4,546,342

DATA COMPRESSION METHOD AND APPARATUS

Charles S. Weaver, Palo Alto, Calif.; Robert A. LeBlanc, Montreal, Canada, and Lawrence E. Sweeney, Jr., Atherton, Calif., assignors to Digital Recording Research Limited Partnership, Menlo Park, Calif.

Filed Dec. 14, 1983, Ser. No. 561,723

Int. Cl.[4] H03K *13/00*

U.S. Cl. 340—347 DD **44 Claims**

1. In a data reduction system of the type for preparing varying average energy level analog input signals for storage or transmission, the combination comprising

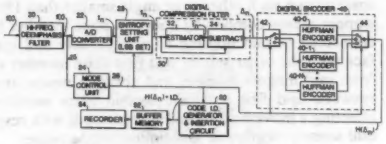
analog to digital converter means for converting the analog input signal to equal length digital sample signals,

digital compression filter means responsive to digital sample signals from said analog to digital converter means for generating a stream of equal length compressed signals,

digital encoding means implementing a truncated variable word length code for encoding the compressed signals from said digital compression filter means,

entropy setting means for controlling the entropy of signals supplied to said digital compression filter means to control the entropy of signals from the compression filter,

mode control means for obtaining a measure of the average energy level of the input signal prior to encoding by said digital encoding means and for producing an output indicative of an energy level band within which said signal falls, there being a plurality of different energy level bands



ranging from low to high energy levels through which said signal may operate, and

means for controlling the entropy setting means in response to the output from the mode control means for step control thereof with energy level band changes, the entropy of signals supplied to the digital compression filter means being reduced by said entropy setting means with changes from a lower to a higher energy level band and being increased with changes from a higher to a lower energy level band, the ratio σ/q being changed by a factor of 2^x with each change in energy level band, wherein σ is standard deviation of the compressed signal stream from the digital compression filter means, q is quantization level of the digital sample signals, and x is a non-zero integer.

4,546,343

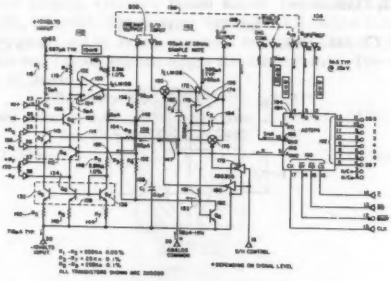
DATA ACQUISITION CHANNEL APPARATUS

Charles H. Higgins, and John D. Skipper, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 3, 1984, Ser. No. 627,691

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 AD **14 Claims**



1. Data input channel signal amplifier apparatus comprising:

an integrated circuit operational amplifier circuit having positive and negative input terminals and a unitary output terminal;

first and second co-mounted bipolar signal preamplifier transistors having base terminals connected to the positive and negative terminals of an input channel differential signal receiving port, collector terminals connected to said negative and positive operational amplifier circuit

input terminals respectively and having emitter terminals connected together through a differential signal gain determining impedance member, said emitter terminals being also connected with a pair of co-mounted current source transistors;

first and second co-mounted bipolar negative feedback coupling transistors connected between said preamplifier transistors and said co-mounted current source transistors and having collector terminals connected to said preamplifier transistor emitter terminals, emitter terminals connected together through a differential feedback gain determining impedance member and connected also to said co-mounted current source transistors, and having base terminals connected with a zero signal reference node and with said operational amplifier output node respectively through resistor divider networks; and

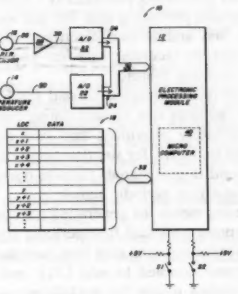
a source of temperature modulated bias signal coupled with said first and second negative feedback transistor base terminals by way of said resistor divider networks.

4,546,344

TEMPERATURE COMPENSATED ALARM SYSTEM

John K. Guscott, Lynnfield, and Mario Casamassima, Randolph, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,104
Int. Cl.[4] G08B *23/00*
U.S. Cl. 340—501 **11 Claims**



1. A temperature compensated alarm system comprising:

an alarm sensor having a known temperature characteristic and operative to produce an electrical output signal representative of a desired parameter to be monitored;

a temperature transducer operative to provide an electrical output signal representative of the ambient temperature in vicinity of the transducer;

a plurality of selectively addressable storage registers containing data representative of alarm threshold limits applicable at specified ambient temperatures;

an electronic processing module including:

means for sampling said alarm sensor and temperature transducer output signals;

means for addressing and accessing threshold data from at least one selected register of said plurality in response to said transducer output signal; and

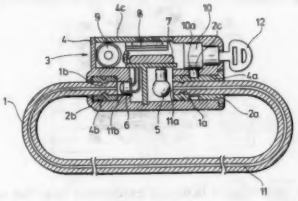
means for generating an alarm signal if said sensor output signal exceeds said threshold data from said at least one selected register.

4,546,345

THEFT PREVENTING DEVICE

Hiroyasu Naito, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,430
Claims priority, application Japan, Aug. 13, 1981, 56-127348
Int. Cl.[4] E05B *45/06, 73/00*; G08B *13/18*
U.S. Cl. 340—542 **7 Claims**



1. A portable and self-contained theft preventing device comprising:

a lockable unitary lock body having a housing;

a lock mechanism disposed in said housing;

a cable member having one end thereof secured to said unitary lock body and the other end thereof fastenable to said unitary lock body;

at least one light-conducting member extending through and along said cable member;

an alarm system contained in said lock body housing;

said housing being formed at one side thereof with a cable receiving hole for receiving said other end of said cable member and a key receiving hole for receiving a key member;

said alarm system including an alarm device, a drive circuit operable to drive said alarm device when said lock body is in its locking position, and an inhibiting circuit for inhibiting operation of said drive circuit, said inhibiting circuit being completed by said light-conducting member;

said inhibiting circuit includes a light-emitting element operable in synchronism with a locking operation to initiate emission of light therefrom, a light-receiving element which generates a voltage in accordance with the amount of light received thereby, and an amplifier circuit connected to said light-emitting element;

said light-emitting element and said light-receiving element being disposed within said housing of said lock body;

said lock mechanism having a lock cylinder which is operable by means of said key member;

said alarm system further including a power source and a switch mechanism interposed between said power source and said drive and inhibiting circuits; and

said switch mechanism being operatively associated with said lock cylinder.

4,546,346

SEWER LINE BACKUP DETECTION, ALARM AND DETENTION APPARATUS

Larry E. Wave, and Richard S. Woods, both of West Palm Beach, Fla., assignors to Sanity Saver Cap Company, Wilmington, Del.

Filed Mar. 14, 1983, Ser. No. 475,688
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—608 **10 Claims**

1. A device for detecting a blockage in a sewer line of a sewer system and issuing an alarm to users of the sewer system, said device being self-contained and comprising:

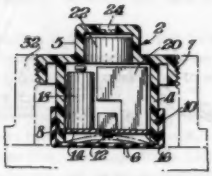
a housing, generally circular in horizontal cross-section and having male connecting threads adapted to fit the female threads of conventional access ports to sewer lines,

said housing containing a power supply and means for issu-

ing an alarm signal to alarm means, which means for issuing an alarm signal are actuated by

a pneumatic switch located in said housing,

and means for activating said pneumatic switch being a highly flexible diaphragm fitted snugly onto the lower end of said housing, said diaphragm effectively sealing the interior of said housing from the environment,



the lower end of said housing extending into the access port such that said flexible diaphragm is located substantially at the inside diameter of said sewer line,

whereby, in the event of the blockage of said sewer line, the blocked material exerts external pressure on the flexible diaphragm which deforms under pressure raising the air pressure inside said housing and actuating the pneumatic switch, said alarm signal is issued to said alarm means, and an alarm is issued.

4,546,347

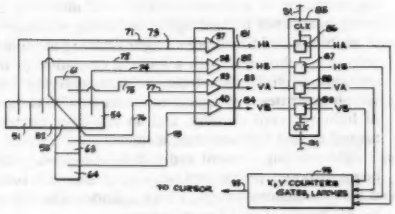
DETECTOR FOR ELECTRO-OPTICAL MOUSE

Steven T. Kirsch, Sunnyvale, Calif., assignor to Mouse Systems Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 264,478, May 18, 1981, Pat. No. 4,390,873. This application Jun. 24, 1983, Ser. No. 508,070

Int. Cl.[4] G08B *5/36*

U.S. Cl. 340—710 **19 Claims**



1. An optical mouse detector system comprising,

a surface having two sets of lines, one set intersecting the other, with spaces therebetween, each set having a characteristic color and a pre-determined width, the lines and spaces having three levels of contrast, including a first level for the lines, a second level for intersections of the lines and a third level for the spaces,

two linear arrays of detector cells movable relative to the surface, each linear array capable of imaging one line and one space from the surface, with one linear array parallel in orientation with one of said two sets of intersecting lines, the second linear array parallel in orientation with the other set, said detector cells having optical means associated with two adjacent detector cells in the same linear array for imaging the width of one line which is a member of the set of lines not parallel to the detector array containing said two adjacent cells, and

means movable over the surface for measuring contrast differences, said means having inputs from two non-adjacent detector cells in the same linear array, said means having an output indicative of contrast differences for signalling line crossings corresponding to changes in contrast differences.

4,546,348

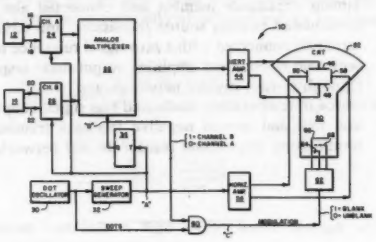
DUAL CHANNEL CURVE TRACER

Robert H. Ashton, Watervliet, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed May 27, 1983, Ser. No. 498,608

Int. Cl.[4] G09G *100*

U.S. Cl. 340—715 **12 Claims**



1. A system for measuring and comparing on the faceplate of a CRT having an electron beam incident thereon first and second output signals of first and second electronic components respectively generated in response to first and second input signals respectively provided thereto, said system comprising:

first timing means for generating a first periodic signal;

first and second channels coupled respectively to said first and second electronic components and to said timing means for generating periodically varying first and second input signals, providing said first and second input signals to said first and second electronic components respectively, and for receiving said first and second output signals in response thereto;

multiplexer means coupled to said CRT, to said first and second channels and to said timing means for receiving and alternately providing said first and second output signals to said CRT for simultaneously displaying said first and second output signals thereon during alternating cycles of said first periodic signal;

second timing means for generating a second periodic signal synchronous with said first periodic signal and having a higher frequency than said first periodic signal; and

control means coupled to said CRT and to said first and second timing means for modulating said electron beam during alternating cycles of said first periodic signal in accordance with said second periodic signal such that the display on the faceplate of the CRT of said first output signal is visibly distinct from the display of said second output signal.

4,546,349

LOCAL ZOOM FOR RASTER SCAN DISPLAYS

LeRoy A. Prohofsky, Minneapolis, and David G. Hanson, Spring Lake Park, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 306,831, Sep. 29, 1981, abandoned. This application Jun. 22, 1984, Ser. No. 623,617

Int. Cl.[4] G09G *1/16*

U.S. Cl. 340—731 **10 Claims**

1. A display system comprising:

a raster scan display having a screen upon which data is displayed;

primary memory means having a multiplicity of addressable storage locations, each of said storage locations in one-to-one correspondence with a one of a like multiplicity of

pixels on said screen, for storing the data that comprises a primary image;

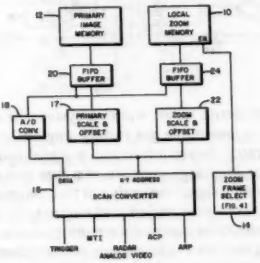
primary scale means for emplacing image data within said primary memory means at a first magnification scale factor;

secondary memory means having a plurality of addressable storage locations, each of said storage locations in a one-to-one correspondence with a one of a like plurality of pixels on said screen, for storing the data that comprises a secondary image;

secondary zoom scale means for emplacing said image data within said secondary memory means at a second magnification scale factor different from said first magnification scale factor;

zoom frame means for establishing the boundaries of a zoom frame on said screen; and

selective gating means for controllably reading the data



from said primary memory means outside of said established zoom frame boundaries and for reading the data from said secondary memory means within said established zoom frame boundaries to said raster scan display for display as a respective primary image and a zoom image upon said screen;

whereby since the storage locations of each of said primary memory means and said secondary memory means are in a one-to-one correspondence with said pixels on said screen while said image data is emplaced within said primary memory means and within said secondary memory means at a respective first and second magnification scale factors which are different, then the magnification scale of said primary image and said zoom image upon said screen will be different;

whereby a zoom image of an area of said primary image is juxtapositioned relative to said primary image upon said screen.

4,546,350

DISPLAY APPARATUS

Kazuyuki Tanaka, Kamakura, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 4, 1982, Ser. No. 374,775
Claims priority, application Japan, May 13, 1981, 56-71703
Int. Cl.[4] G09G *1/16*
U.S. Cl. 340—750 **7 Claims**

1. A display apparatus comprising:

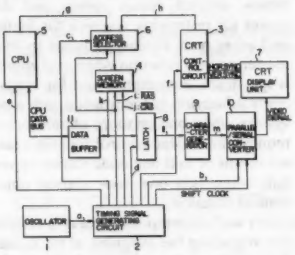
a display means including a cathode ray tube (CRT) of the raster scanning type;

a screen memory for storing data to be displayed on said display means;

a CRT control circuit for supplying a synchronizing signal to said display means and supplying a display address signal which corresponds to a display position on the CRT screen to said screen memory;

a processing circuit for reading to and writing from said screen memory; and

a timing signal generating circuit for providing timing signals including (a) an operating clock signal for said CRT control circuit, (b) a clock signal for said processing circuit and (c) control signals for timing the read-out of display data from said screen memory, said timing signal generating circuit comprising means for dividing a frequency of an applied oscillating signal to produce a plurality of different frequency signals, memory means having address input terminals and data output terminals, said memory means storing data representing said timing signals and receiving at respective address input terminals said plurality of different frequency signals, said memory



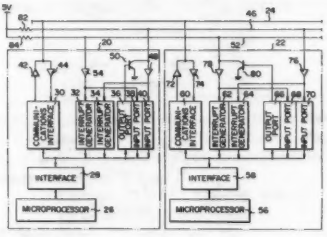
means supplying said stored data at said output terminals in response to said plurality of different frequency signals applied to said address input terminals, and a latching means for eliminating changes in the data at said output terminals of said memory means when said frequency dividing means changes state by storing data at the data output terminals of said memory means and by supplying said stored data to said CRT control circuit, said processing circuit and said screen memory, respectively, as said timing signals in response to said applied oscillating signal.

4,546,351

DATA TRANSMISSION SYSTEM WITH DISTRIBUTED MICROPROCESSORS

Shigeo Nambu, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 14, 1982, Ser. No. 434,184
Claims priority, application Japan, Oct. 18, 1981, 56-166263
Int. Cl.[4] H04Q *9/00*; G06F *15/16*
U.S. Cl. 340—825.5 **20 Claims**



1. A data link control system for plural stations, comprising:

a transmission line coupled to said plural stations for transmitting data and signals; and

a common request line for carrying a request signal which indicates the ability to be assigned to a master control function for supervising the data link, wherein said plural stations contains one node station and other node stations, at least one of which has the same configuration as said one node station, said one node station comprising:

autoresponse means for receiving data from said transmission line in a reception mode and transmitting data of a

predetermined format onto said transmission line in a transmission mode;

control circuit means coupled to said common reuest line for generating said request signal so that said common request line is set to a busy status when said one node station requests to be assigned to the master control function;

detecting circuit means coupled to said common request line for detecting the status of said common request line in accordance with the contents of said request signal; and

microprocessor means coupled to said autoresponse means, control circuit means and detecting circuit means for restraining a search for finding out if any of said other node stations requests to be assigned to the master control function when said common request line is not in the busy status, and for assigning the master control function in accordance with a polling/selecting system when one or more of said other node stations request the master control function, said microprocessor means of said one node station supervising the data link when said one node station obtains the master control function,

wherein said autoresponse means is responsive to a question regarding the assigning of the master control function delivered from one of the stations which has the master control function, but the receiving/transmitting operation of said autoresponse means is free from the operation of said microprocessor means.

4,546,352

NON-COUNTERFEITABLE DOCUMENT SYSTEM

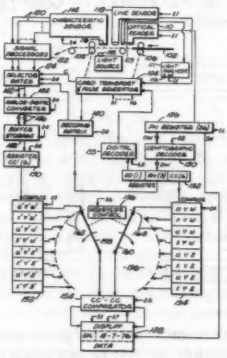
Robert N. Goldman, Kailua, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.

Division of Ser. No. 492,324, Jun. 3, 1983, Pat. No. 4,489,318, which is a division of Ser. No. 276,282, Jun. 22, 1981, Pat. No. 4,423,415, which is a continuation-in-part of Ser. No. 161,838, Jun. 23, 1980, abandoned. This application Jun. 22, 1984, Ser. No. 623,654

The portion of the term of this patent subsequent to May 27, 2000, has been disclaimed.

Int. Cl.[4] **H04Q** *9/00*; **G06K** *5/00, 7/08*

U.S. Cl. 340—825.34 **9 Claims**



1. An authenticator device for verifying authenticity comprising:

a sheet of medium having a varying random characteristic over an area of said sheet, said characteristic being inherent in the composition of said medium; and

machine-readable indicia on said sheet of medium, decodable to explicitly indicate at least one specific area location on said sheet at which the characteristic is to be measured.

4,546,353

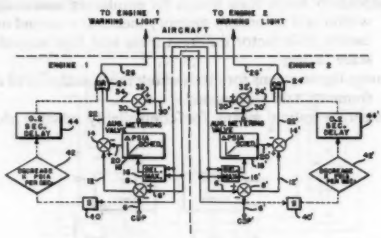
ASYMMETRIC THRUST WARNING SYSTEM FOR DUAL ENGINE AIRCRAFT

William W. Stockton, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1984, Ser. No. 577,412

Int. Cl.[4] **G08B** *23/00, 21/00*; **F02K** *3/00*; **G01L** *3/26*

U.S. Cl. 340—966 **6 Claims**



1. An asymmetric thrust warning system for aircraft having at least two augmentable gas turbine engines comprising:

first comparator means receiving a signal indicative of the compressor discharge pressure of a first one of said engines and receiving a signal indicative of the compressor discharge pressure of a second one of said engines;

said first comparator means determining which of said first or second engines has the lower compressor discharge pressure and providing an actual pressure difference signal;

second comparator means receiving said actual pressure difference signal from said first comparator means and receiving a maximum allowable pressure difference signal;

said second comparator means providing a first asymmetric thrust warning signal if the level of said actual pressure difference signal exceeds the level of said maximum allowable pressure difference signal;

third comparator means receiving a signal indicative of the position of the augmenter metering valve of said first engine and a signal indicative of the position of the augmenter metering valve of said second engine;

said third comparator means providing a second asymmetric thrust warning signal when the augmenter metering valve of said first engine and the augmenter metering valve of said second engine are in different operating positions;

thrust warning means; and

gate means for coupling said first and second thrust warning signals to said thrust warning means.

4,546,354

RANGE/AZIMUTH SHIP IMAGING FOR ORDNANCE CONTROL

Sol Boles, Syosset, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 17, 1982, Ser. No. 389,367

Int. Cl.[4] **G01S** *13/90*

U.S. Cl. 343—17 **7 Claims**

1. In conjunction with an airborne synthetic aperture radar system having an interferometer antenna and a range versus azimuth angle display, a method for forming with improved azimuth resolution a scaled range/azimuth image of a ship target under the influence of sea state conditions comprising the steps of:

(a) steering the pointing of the interferometer antenna boresight to provide radar illumination of the ship target;

(b) controlling the range sampling timing so that corresponding samples from pulse-to-pulse over the coherent integration interval correspond to the same range increment of the ship target;

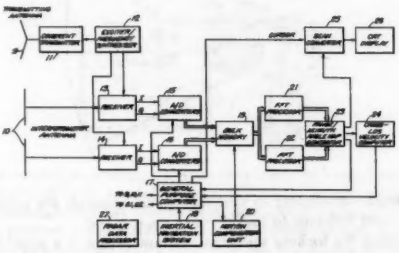
(c) compensating for phase variations in the received signals

due to the respective motions of the radar bearing aircraft and the ship;

(d) measuring interferometrically the compensated received signals for each doppler filter in each range bin;

(e) plotting as interferometer azimuth angle versus filter doppler frequency the measured data for each doppler filter in each range bin;

(f) performing a weighted least squares linear regression straight line fit to the plotted data points of the azimuth angle/doppler distribution for each range bin;



(g) determining the slope of the straight line fit to the azimuth angle/doppler distribution for each range bin;

(h) averaging the slope values determined over all range bins; and

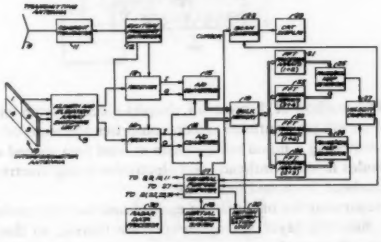
(i) determining from the averaged slope value the values of predetermined system parameters including synthetic aperture radar integration time and doppler filter bandwidths and spacings to be used predictively in the succeeding coherent integration interval in forming the range/azimuth image.

4,546,355

RANGE/AZIMUTH/ELEVATION SHIP IMAGING FOR ORDNANCE CONTROL

Sol Boles, Syosset, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 17, 1982, Ser. No. 389,369
Int. Cl.[4] G01S *13/90*
U.S. Cl. 343—17 **18 Claims**



1. In conjunction with an airborne synthetic aperture radar system having an interferometer antenna and a display, a method for forming high resolution synthetic aperture radar imagery of a ship target under the influence of sea state conditions comprising the steps of:

(a) processing the received signals from the scatterers comprising the ship target to obtain estimates of (1) the net doppler producing cross line-of-sight velocity of the radar bearing aircraft relative to the ship, and (2) the net doppler producing velocity in the direction orthogonal to the cross line-of-sight relative velocity and the radar line-of-sight to the center of rotation tracking point of the ship;

(b) determining from the estimated doppler producing velocities the values of predetermined system parameters to be used predictively in the succeeding integration interval in forming the high resolution image of the ship target; and

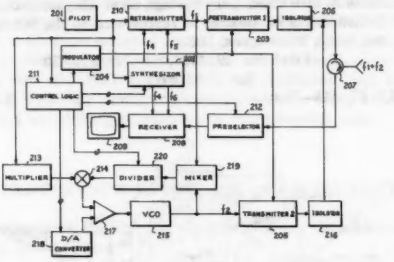
(c) displaying the formed imagery of the ship target including a range/azimuth projection, an azimuth/elevation profile projection, and a range/elevation profile projection.

4,546,356

PROCESS FOR THE PROTECTION OF A RADAR AGAINST JAMMING AND RADAR FOR PUTTING THIS PROCESS INTO EFFECT

Christian Petitjean, and Guy L. Parquier, both of Boulogne-Billancourt, France, assignors to LMT-Radio Professionnelle, Boulogne-Billancourt, France

Filed Aug. 16, 1982, Ser. No. 408,412
Claims priority, application France, Aug. 21, 1981, 81 16118
Int. Cl.[4] G01S *7/36*
U.S. Cl. 343—18 E **6 Claims**



1. A process for the protection of a radar having a transmitter and receiver against jamming comprising the steps of transmitting a useful signal formed from pulses having a first frequency f1, simultaneously transmitting therewith a pseudo signal formed from pulses synchronous with those of the useful signal and having a second frequency f2, close to and differing from f1, and an amplitude higher than that of the useful signal, wherein said transmitted signals have a shift between said frequencies f1 and f2 greater than three times the band width of an intermediate frequency amplifier of the radar receiver, and wherein the amplitude of the pseudo signal is more than approximately 10 decibels higher than the amplitude of the useful signal.

4,546,357

FURNITURE ANTENNA SYSTEM

Thomas C. Laughon, Alpharetta, Ga.; H. Taylor Haynes, Charlotte, N.C.; Robert T. Klopach, State College, Pa., and Richard C. Warner, Morris Plains, N.J., assignors to The Singer Company, Stamford, Conn.

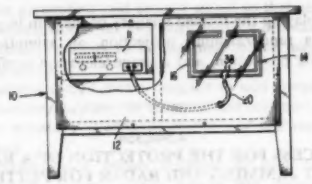
Filed Apr. 11, 1983, Ser. No. 484,076
Int. Cl.[4] H01Q *1/24*
U.S. Cl. 343—702 **4 Claims**

1. An antenna system including an antenna structure for an article of furniture having an exterior coated finish, said antenna system comprising:

a coating of low loss dielectric sealing material applied over at least a specific portion of the exterior finished surface of said article of furniture upon which said antenna structure of said antenna system may be applied where required to avoid a loss of signal from said antenna structure;

said antenna structure comprising trace coatings of conductive ink applied to said article of furniture over said sealing material;

means for making an electrically conductive connection to said trace coatings; and a coating of sealing and abrasion



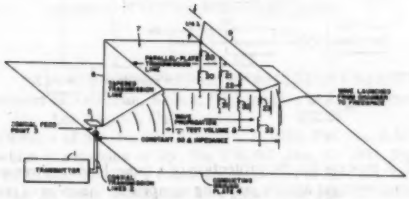
resistant material applied over said trace coatings and said connection means.

4,546,358

LARGE BROADBAND FREE RADIATING ELECTROMAGNETIC TEST CELL

George R. Edlin, Huntsville; Thomas H. Shumpert, Auburn, and Brian R. Strickland, Lacy Springs, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1984, Ser. No. 572,030
Int. Cl.⁴ H01Q *11/04*
U.S. Cl. 343—703 **5 Claims**



1. A broadband uniform electromagnetic field environment producing system comprising first and second parallel-plate transmission line elements adapted to be connected to an electromagnetic generating device at one end; said first transmission line element being a large conducting ground plane; said second transmission line element being spacially located parallel to said first element whereby the electromagnetic field environment is produced between first and second elements; a plurality of resistors connected to the other end of said second element and to said first element so as to act as termination loads to a band of frequencies in the lower range of the broadband electromagnetic field produced; and a horn element connected to said other end of said second transmission line element for allowing an upper band of frequencies of said broadband electromagnetic field to be transmitting out of the environment.

4,546,359

ANTENNA WITH A POLARIZATION ROTATOR IN WAVEGUIDE FEED

Nhu Bui-Hai, Paris, France, assignor to Thomson CSF, Paris, France

Filed Mar. 26, 1982, Ser. No. 362,520
Claims priority, application France, Mar. 31, 1981, 81 06431
Int. Cl.⁴ H01Q *19/13;* H01P *1/16*
U.S. Cl. 343—781 R **1 Claim**

1. An antenna for working with linearly polarized waves, comprising:

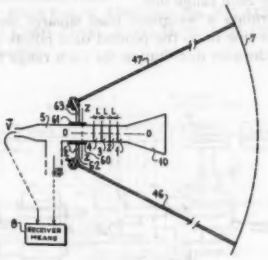
a primary source including, in series:

means defining an aperture;

a transposition device, capable of transposing the direction of two orthogonal polarizations of the waves passing therethrough, and formed from a square cross-section twisted waveguide which is adjustable in steps; and

a waveguide element;

a reflector placed opposite said aperture means;



means, connected to said waveguide element, for securing said reflector to said primary source; and

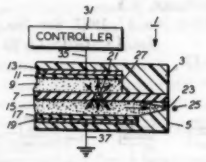
means for locking said transposition device in a position in which it has been adjusted.

4,546,360

ELECTROTHERMIC INK JET

Kenneth H. Fischbeck, Dallas; Linda T. Creagh, Argyle, and Curt R. Raschke, Dallas, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1983, Ser. No. 562,344
Int. Cl.⁴ G01D *15/16*
U.S. Cl. 346—1.1 **2 Claims**



1. The method of discrete ink droplet ejection from an orifice of an ink jet printhead which comprises the steps of:

(a) providing a liquid ink between at least two spaced electrodes in the printhead, said electrodes being electrically insulated from said liquid ink;

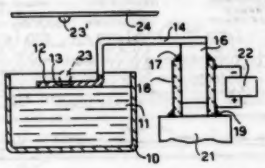
(b) separating the ink adjacent each of said two electrodes by a dielectric layer having an aperture therein, so that the ink adjacent the two spaced electrodes are isolated and communicate with each other only through the aperture; and

(c) applying an electrical potential pulse between said electrodes to induce a current pulse between the two electrodes, the aperture in the dielecctric layer causing the induced current pulse to move through the aperture and be focused thereby, the magnitude of the electrical potential pulse being of sufficient magnitude to provide an induced current vaporization of said ink only in the aperture where the induced current is focused in order to form temporarily a bubble in the aperture which causes a discrete ink droplet to be ejected from the printhead orifice by the bubble expansion and collapse.

4,546,361
INK JET PRINTING METHOD AND DEVICE

Riccardo Brescia, Ivrea; Enrico Manini, Camandona; Edoardo Balbo, Banchette, and Alessandro Scardovi, Ivrea, all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 26, 1983, Ser. No. 545,506
Claims priority, application Italy, Oct. 26, 1982, 68245 A/82
Int. Cl.[4] G01D 15/16
U.S. Cl. 346—140 R 12 Claims

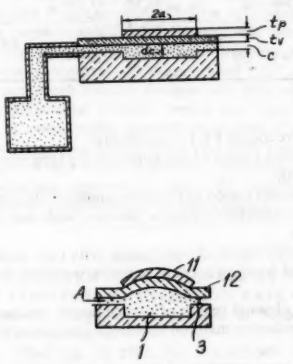


1. An ink jet printing method comprising the steps of providing a wall with a capillary circular nozzle having a section substantially smaller than the area of the wall, locating a printing support at a predetermined distance from the wall, keeping the wall in contact with a volume of ink, connecting an electric transducer at one end to said wall and at the other end with a frame, and selectively energizing the transducer by an electric pulse to suddenly move the wall toward the ink whereby the reaction of the inertia of the ink in following the movement of the wall causes an ink droplet to be ejected through the nozzle at such a speed as to reach said support.

4,546,362
LOW VOLTAGE INK-JET PRINTHEAD

Haruhiko Koto, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of, Japan

Filed Jun. 30, 1982, Ser. No. 394,051
Claims priority, application Japan, Jul. 2, 1981, 56-104289
The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.
Int. Cl.[4] G01D 15/18
U.S. Cl. 346—140 R 15 Claims



1. An ink-jet printer head comprising:
a piezoelectric element having an electrical capacitance cp;
a pressurization chamber coupled to said piezoelectric element for containing ink therein;
an ink ejection passage including nozzle of cross-section A and a flow passage interconnecting said pressurization chamber and said nozzle, said ink ejection passage having fluid inertance m_3, said piezoelectric element being deformable upon application of a drive voltage V to increase the volume of said pressurization chamber, and to restore said volume after removal of said drive voltage in synchronization with a damped oscillation of said printer head for ejecting ink from said nozzle;
a vibratory system including said piezoelectric element, said vibratory system having an acoustic capacitance Co;
a flow passage system including said ink ejection passage, said pressurization chamber and an ink supply passage for providing ink to said pressurization chamber, the physical and electrical interrelationships in said ink-jet printer head being represented by the equation

$$V = \sqrt{\frac{2\psi^2 Co}{K^2 cp}}$$

where

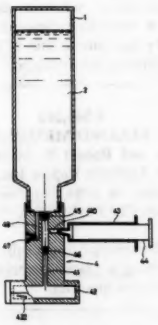
$$\psi = \frac{Vm\, Am_3\, C\, E}{Co\, f(tn,\tau)}$$

and $f(t,\tau) = -\exp(-Dt)\sin Et + \exp[-D(t-\tau)]\sin E(t-\tau)\,\tau$ is width of an applied pulse, t is time, tn is time which maximizes $f(t,\tau)$, ψ is pressure imposed by the piezoelectric element, K is a proportional constant, Vm is the ejection speed of the ink, A is the cross-sectional area of the nozzle, C is the acoustic capacitance with compressibility in the pressure chamber taken into account, D is the damping coefficient, and E is angular frequency, said acoustic capacitance Co being selected to bring said driving voltage nearly to a minimum value.

4,546,363
NOZZLE CLEANING DEVICE FOR AN INK JET SYSTEM PRINTER

Fusao Iwagami, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 25, 1984, Ser. No. 623,919
Claims priority, application Japan, Jun. 29, 1983, 58-102191[U]
Int. Cl.[4] G01D 15/18
U.S. Cl. 346—140 R 3 Claims



1. A nozzle cleaning device for cleaning a print head of an ink jet system printer, comprising:
a cleaning solvent tank containing the cleaning solvent therein;
an ejecting unit including at least one orifice through which the cleaning solvent is ejected toward said print head;
liquid passage means for communicating said at least one orifice included in said ejecting unit with said cleaning solvent tank;
a cylinder communicated to said liquid passage means at a point in said liquid passage means;
a piston slidably disposed in said cylinder;
a first check valve disposed in said liquid passage means at a

position between said point and said cleaning solvent tank; and

a second check valve disposed in said liquid passage means at a position between said point and said ejecting unit,

wherein said first and second check valves function, in combination, to ensure a stable supply of cleaning solvent from said cleaning solvent tank to said ejecting unit in response to the movement of said piston in said cylinder.

4,546,364

HEAD FOR ELECTROSTATIC RECORDING

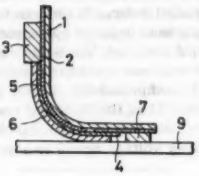
Hidemasa Todoh, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 545,975

Claims priority, application Japan, Oct. 29, 1982, 57-190467; Oct. 29, 1982, 57-190468; Oct. 29, 1982, 57-190470

Int. Cl.⁴ G01D *15/06*

U.S. Cl. 346—155 **18 Claims**



1. An electrostatic recording head having an array of stylus electrodes each of which is provided with a voltage responsive to recording information for scanning signals by lines in a horizontal direction, said head comprising; a thin metal sheet substrate having a predetermined size and thickness to function as a spring, a first insulating layer of a predetermined thickness formed on one side of the thin metal sheet, lead electrodes fixed at a given interval on the first insulating layer and connected at one end to a drive circuit mounted on said fist insulating layer, recording electrodes provided at the other end of said lead electrodes, and a second insulating layer disposed over said lead electrodes, wherein electrostatic recording being effected on a recording element that has been given charges of a polarity opposite to that of the voltage applied in response to the recording information.

4,546,365

RECORD MEMBER

Bruce W. Brockett, and Robert E. Miller, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed May 23, 1984, Ser. No. 612,960

Int. Cl.⁴ B41M *5/16, 5/22*

U.S. Cl. 346—214 **24 Claims**

1. A record member comprising a substrate and a developer composition comprising a glass comprising a biphenol color developer and a resinous material.

4,546,366

POLYSILICON/SILICON JUNCTION FIELD EFFECT TRANSISTORS AND INTEGRATED CIRCUITS (POSFET)

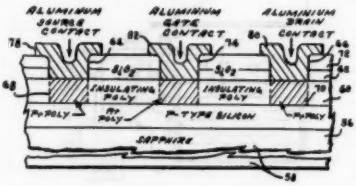
Bobby L. Buchanan, 351 Baldwin Rd., Carlisle, Mass. 01741

Division of Ser. No. 147,042, May 6, 1980, , Continuation of Ser. No. 899,673, Apr. 24, 1978,. This application Feb. 19, 1982, Ser. No. 350,496

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **5 Claims**

1. A junction field effect transistor for use with large scale integrated circuits having at least one set of source, drain and gate components comprising: a bounding substrate; an overlay substrate having a given conductivity type overlying the bounding substrate; a planar layer of insulative material overlying and contacting the overlay substrate and having formed therein apertures for receiving source, drain and gate material; polysilicon gate material of an opposite conductivity type than said overlay substrate filling said gate aperture and overlying the overlay substrate forming a p-n junction at the interface; conductive material filling the source and drain apertures; and electrical contacts for connecting the source, drain and gate components to an electrical circuit,



wherein the insulative material is polysilicon, the gate component is formed of polysilicon doped in the conductivity type opposite that of the overlay substrate material and source and drain components are formed of polysilicon doped in the conductivity type similar to that of the overlay substrate.

4,546,367

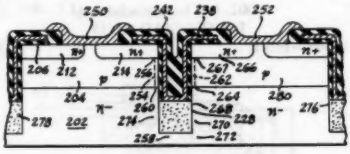
LATERAL BIDIRECTIONAL NOTCH FET WITH EXTENDED GATE INSULATOR

Herman P. Schutten, Milwaukee, Wis.; Robert W. Lade, Fort Myers, Fla., and James A. Benjamin, Waukesha, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 21, 1982, Ser. No. 390,473

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.4 **10 Claims**



1. A bidirectional FET, comprising:

a first source region of one conductivity type semiconductor material;

a first channel region of opposite conductivity type semiconductor material forming a junction with said first source region;

a single drift region of one conductivity type semiconductor material forming another junction with said first channel region;

a second channel region of said opposite conductivity type semiconductor material forming a junction with said drift region;

a second source region of said one conductivity type semiconductor material forming a junction with said second channel region;

a notch extending between and separating said first and second source regions and said first and second channel regions, and extending into said drift region;

insulated gate means in said notch proximate said first and second channel regions and adapted for application of an electrical potential for producing electric fields of sufficient intensity to invert the conductivity type in said first and second channel regions;

whereby upon application of voltage of either polarity to said first and second current source regions, electric cur-

rent can flow in a respective corresponding direction between them, under control of said electrical potential of said gate means, the conductive current path through said drift region traversing along one side of said notch then around the end thereof then along the other side of said notch;

said single drift region around said notch supporting OFF state blocking voltage in both directions;

wherein said channel regions are laterally sapced by said notch, and said notch extends vertically downwardly from a top major surface of said FET, said channel regions extending generally vertically along respective sides of said notch, said drift region being below said channel regions, two junctions being mesa stacked on each side of said notch, a first side of said notch having said junction between said first source region and said first channel region and said junction between said first channel region and said drift region, a second side of said notch having said junction between said second source region and said second channel region and said junction between said second channel region and said drift region;

wherein said source regions are laterally spaced along said top major surface by said notch therebetween, said source regions being above respective said channel regions;

and comprising a pair of main electrodes each connected to a respective said source region, and wherein said insulated gate means comprises insulation layer means extending along the inner surface of said notch, and gate electrode means disposed in said notch along said insulation layer means such that said gate electrode means extends in close proximity along and insulated from said vertical channel regions;

wherein said FET has an OFF state in the absence of said electric gate potential, with the junction between said drift region and one of said channel regions blocking current flow toward one of said main electrodes, and with the junction between said drift region and the other said channel regions blocking current flow toward the other of said main electrodes;

wherein the drift region current path between said main electrodes extends from said source region downwardly through said channel regions and downwardly around the bottom of said notch so as to increase the drift region current path length and afford higher OFF state blocking voltage capability, without increasing the lateral dimension along said top major surface, whereby to afford a high density, high voltage bidirectional FET structure;

wherein said notch extends downwardly into said drift region a substantial distance below said gate electrode means to substantially diminish attraction of carriers by said gate electrode means from said drift region toward the edges of said notch, to prevent unwanted inducement of conduction channels in said OFF state and afford higher OFF state voltage blocking capability.

4,546,368

CHARGE TRANSFER DEVICE HAVING A PRECISELY CONTROLLED INJECTION RATE

Kenzo Yamanari, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1982, Ser. No. 418,956

Claims priority, application Japan, Sep. 17, 1981, 56-146761

Int. Cl.⁴ H01L *29/78*; G11C *19/28*

U.S. Cl. 357—24 **12 Claims**

1. A charge transfer device, comprising:

a semiconductor substrate;

charge producing means for producing charges in said semiconductor substrate;

a charge transferring section formed on said semiconductor substrate and displace from said charge producing means in a charge transferring direction;

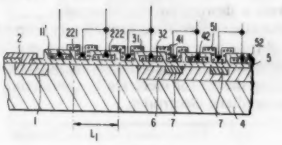
a first insulating layer formed on said substrate and having a uniform thickness;

a first gate electrode formed on said first insulating layer adjacent said charge producing means;

a second partial electrode formed on said first insulating layer between said first gate electrode and said transferring section;

a second insulating layer formed over said first gate electrode and second partial electrode;

a first partial electrode having parts formed over said second insulating layer and partially overlapping said first gate



electrode and second partial electrode with the remainder of said first partial electrode being formed on said first insulating layer positioned between said first gate electrode and said second partial electrode, said first and second partial electrodes being formed over a portion of said substrate having a uniform impurity concentration and being connected together to form a second gate electrode; and

means for applying the same electric field to said first and second partial electrodes.

4,546,369

LIGHT-ACTIVATED AMPLIFIED GATE BI-DIRECTIONAL THYRISTOR

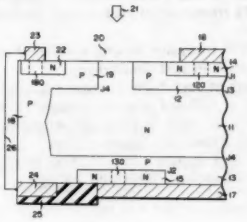
Tsuneo Tsukakoshi, Zushi, and Hiromichi Ohashi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 25, 1983, Ser. No. 545,237

Claims priority, application Japan, Nov. 24, 1982, 57-205661

Int. Cl.⁴ H01L *29/747*

U.S. Cl. 357—39 **10 Claims**



1. A light-activated bi-directional thyristor of a planar structure, comprising:

a first thyristor having an N type emitter layer, a P type base layer, an N type base layer and a P type emitter layer;

a second thyristor having an N type emitter layer, a P type base layer, an N type base layer and a P type emitter layer, the P type base layer in the second thyristor being formed integral with the P type emitter layer in the first thyristor, the N type base layer in the second thyristor being formed integral with the N type base layer in the first thyristor, the P type emitter layer in the second thyristor being formed integral with the P type base layer in the first thyristor, PN junctions formed by the P and N type base layers in the second thyristors and by the N type base layer and the P type emitter layer in the second thyristor being exposed on one of the main surfaces of a semiconductor layer, and parts of the P type base layers in the first

and second thyristors being formed on the side of a light receiving section and being separated by the N type base layer in the first and second thyristors, so as to cause the first and second thyristors to be activated in response to a light signal applied from the outside;

an amplifying gate section formed at that part of the P type base layer in the second thyristor which is located on the side of the light receiving section, said amplifying gate section comprising an N type emitter layer formed in the P type base layer and a first auxiliary electrode bridging the N type emitter layer and the P type base layer to constitute a shorted emitter structure;

a second auxiliary electrode insulatingly formed at that part of the P type base layer in the second thyristor which is located opposite the light receiving section; and

a connecting means for electrically connecting the first and second auxiliary electrodes.

4,546,370

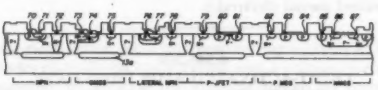
MONOLITHIC INTEGRATION OF LOGIC, CONTROL AND HIGH VOLTAGE INTERFACE CIRCUITRY

Patrick A. Curran, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 532,812, Sep. 15, 1983, which is a continuation of Ser. No. 306,459, Sep. 28, 1981, which is a division of Ser. No. 12,267, Feb. 15, 1979,. This application Nov. 21, 1984, Ser. No. 674,715

Int. Cl.⁴ H01L *27/02*

U.S. Cl. 357—43 **5 Claims**



1. An integrated semiconductor circuit, comprising:

a self-aligned D-MOS transistor, having a channel region, a source and a drain on opposite sides of said channel region, and a backgate region at least partially within said channel region;

and a vertical NPN transistor, having an emitter, a base and a collector, said NPN transistor being isolated from said D-MOS transistor to enable high performance operation thereof;

the D-MOS transistor having a diffused dopant concentration profile in said channel region;

the emitter of said NPN transistor being formed in a well having a diffused dopant concentration profile corresponding to said dopant concentration profile of said D-MOS transistor channel region;

whereby said dopant concentration profiles determine the D-MOS transistor threshold voltage.

4,546,371

SEMICONDUCTOR DEVICE HAVING AN IMPROVED DUAL-GATE FIELD EFFECT TRANSISTOR

Adalbertus H. J. Nieveen van Dijkum; Robbert C. Thuis, and Paul Zandveld, all of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

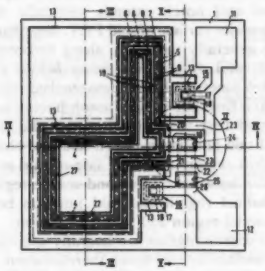
Filed Sep. 17, 1982, Ser. No. 419,351

Claims priority, application Netherlands, Sep. 25, 1981, 8104414

Int. Cl.⁴ H01L *29/78, 23/48, 23/52*

U.S. Cl. 357—51 **5 Claims**

1. A semiconductor device comprising a semiconductor body which includes a field effect transistor and which is partly covered with an insulating layer, said semiconductor body comprising an active transistor region with a plurality of semiconductor zones of one conductivity type which are embedded in the semiconductor body and which adjoin the surface thereof, said semiconductor zones forming two electrode zones, one of which surrounds the other, and at least one island zone which is situated therebetween, enclosing channel regions of the opposite conductivity type, at lest first and second gate electrodes provided on the insulating layer above the channel regions, said first gate electrode having two ends and completely surrounding said second gate electrode, said first and second gate electrodes being connected, respectively, to a first and a second bond pad, which bond pads are provided on



the insulating layer, the first bond pad being situated outside the active transistor region, the second bond pad also being situated outside the active transistor region, the first gate electrode being interrupted at the location of the connection between the second gate electrode and the second bond pad, said second electrode forming a closed loop and both ends of the first gate electrode being connected to the first bond pad so that said first gate electrode also forms a closed loop.

4,546,372

PHOSPHOROUS-NITROGEN BASED GLASSES FOR THE PASSIVATION OF III-V SEMICONDUCTOR MATERIALS

Alexander J. Shuskus, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 11, 1983, Ser. No. 484,082

Int. Cl.⁴ H01L *27/24, 29/78, 29/161, 29/34*

U.S. Cl. 357—52 **3 Claims**

1. A III-V semiconductor material having a passivating layer of substantially oxygen-free, amorphous phospham glass thereon.

4,546,373

SEMICONDUCTOR DEVICE WITH A TANTALUM IRIDIUM BARRIER LAYER CONTACT STRUCTURE

Anthony G. Todd, Hertfordshire, and Dennis K. Wickenden, London, both of England, assignors to The General Electric Company, p.l.c., England

Filed Jan. 30, 1984, Ser. No. 575,066

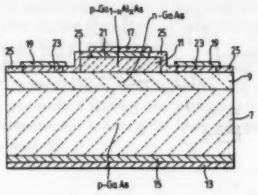
Claims priority, application United Kingdom, Feb. 7, 1983, 8303298

Int. Cl.⁴ H01L *23/48, 23/56;* H01V *3/00*

U.S. Cl. 357—67 **6 Claims**

1. A temperature sensor comprising: a bipolar transistor having an emitter base and collector regions, an adjustable constant current source connected between the collector and base regions of said transistor and a high gain amplifier having an input connected with said current source and an output

connected to the emitter region of said transistor wherein the junction between the emitter and base regions of said transistor is a heterojunction and each of the emitter and base regions of



said transistor is provided with a respective metal contact from which it is separated by a barrier layer of an amorphous tantalum iridium alloy.

4,546,374

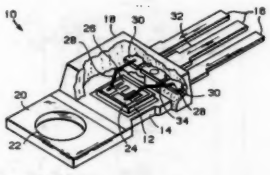
SEMICONDUCTOR DEVICE INCLUDING PLATELESS PACKAGE

Dennis R. Olsen, and Keith G. Spanjer, both of Scottsdale, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 246,784, Mar. 23, 1981, abandoned. This application May 18, 1984, Ser. No. 611,923

Int. Cl.⁴ H01L *23/48, 23/02*

U.S. Cl. 357—71 **11 Claims**



1. A semiconductor device comprising in combination: an unplated copper alloy die mount package portion; a semiconductor die having first and second surfaces; a first metallization on said first surface and making electrical contact thereto; a non lead-based, non gold-based metallic solder metallurgically compatible with said first metallization and with said copper alloy die mount package portion, said solder joining said die to said die mount package portion; a second metallization patterned on said second surface and making electrical contact to selected portions thereof; a copper alloy lead connector package portion mechanically fixed with respect to said die mount package portion; copper connecting means ultrasonically bonded between and electrically interconnecting said second patterned metallization and said lead connector package portion; and means for enclosing said semiconductor die, said copper connecting means, and a portion of each of said die mount and lead connector package portions.

4,546,375

VERTICAL IGFET WITH INTERNAL GATE AND METHOD FOR MAKING SAME

Scott C. Blackstone, Hopewell; Lubomir L. Jastrzebski, Plainsboro, and John F. Corboy, Jr., Ringoes, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 5, 1982, Ser. No. 439,563

Claims priority, application United Kingdom, Jun. 24, 1982, 8218283

Int. Cl.⁴ H01L *27/12, 29/04, 29/78, 27/02*

U.S. Cl. 357—23.4 **5 Claims**

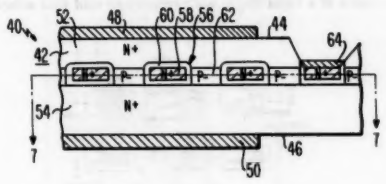
1. A vertical, enhancement-type IGFET device, comprising:

a monocrystalline silicon wafer having first and second opposing major surfaces;

a substantially planar source electrode disposed on the first surface;

a drain electrode disposed on the second surface; and

an insulated gate electrode having a doped polycrystalline silicon conductive finger portion which is surrounded by an insulating layer and by monocrystalline silicon, said insulated gate electrode being internally disposed within the monocrystalline silicon wafer, the silicon that is disposed between the finger and each of the major surfaces being of first conductivity type so as to form a source region at the first surface and a drain region at the second surface, and the silicon that is disposed adjacent to the finger and between the source and drain regions being of second conductivity type, such that a predetermined voltage applied to the insulated gate electrode will regulate a current flow between the source and drain electrodes.



4,546,376

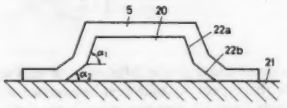
DEVICE FOR SEMICONDUCTOR INTEGRATED CIRCUITS

Toshikazu Nakata, and Takashi Toida, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,535

Int. Cl.⁴ H01L *29/78*

U.S. Cl. 357—23.7 **2 Claims**



1. A device for semiconductor integrated circuits having a silicon single crystal film formed on a sapphire substrate by hetero epitaxy and isolated islands having side planes, wherein one of said side planes makes an angle of 65° or more with the surface of said sapphire substrate at a part at least more than half thickness from the surface of said silicon single crystal film and makes an angle of 55° or less at a residual thickness.

4,546,377

CIRCUIT ARRANGEMENT FOR PROCESSING COLOR TELEVISION SIGNALS

Yoshitaka Kasagi, Yokohama, and Tokio Aketagawa, Kumagaya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 3, 1983, Ser. No. 500,864

Claims priority, application Japan, Jun. 4, 1982, 57-96024

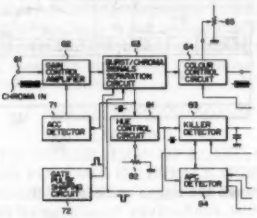
Int. Cl.⁴ H04N *9/50*

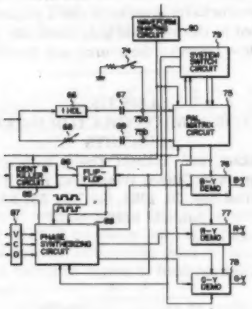
U.S. Cl. 358—23 **15 Claims**

1. A circuit arrangement for processing colour television signals, in which a first composite colour signal and a second composite colour signal are independently processed, said first composite colour signal includes first and second colour difference signals which are quadrature-modulated on first and second modulation axes respectively, a first subcarrier for demodulating said first colour difference signal being not in-

verted every horizontal line and a second subcarrier for demodulating said second colour difference signal being inverted every horizontal line, and said second composite colour signal includes first and second colour difference signals which are guadrature-modulated on first and second modulation axes respectively, first and second subcarriers for demodulating said first and second colour difference signals being not inverted every horizontal line, comprising:

means for generating said second subcarrier which is used to demodulate said first composite colour signal and separated at a right angle with respect to said first subcarrier;





means for correcting a phase difference of said second subcarrier with respect to said first subcarrier to a certain angle, excluding 90 degrees, when demodulating said second colour difference signal of said second composite colour signal; and

means for performing colour killer detection of said first conposite colour signal in such a manner that a colour burst signal in said first composite colour signal and a colour killer detection subcarrier having said corrected phase difference are phase-detected.

4,546,378

MOVEMENT DETECTION CIRCUIT FOR A PAL TELEVISION SIGNAL

Marcellinus J. J. C. Annegarn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

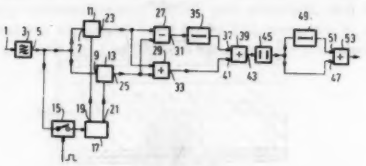
Filed Jul. 18, 1983, Ser. No. 514,400

Claims priority, application Netherlands, Aug. 4, 1982, 8203095

Int. Cl.⁴ H04N *9/535*

U.S. Cl. 358—31 **4 Claims**

1. A movement detection circuit for a PAL television signal containing a luminance signal and a chrominance signal having two quadrature components u(t) sin wt and ±v(t) cos wt, this movement detection circuit comprising a picture delay circuit, characterized in that the movement detection circuit further comprises demodulation circuit means for the chrominance signal, a combining circuit (3) and a filter circuit (3) to obtain a signal of the shape $(u(t)-u'(t))\pm(v(t)-v'(t))$, wherein u'(t) and v'(t) are demodulated chrominance signal components which are delayed relative to u(t) and v(t) by a time delay provided by the picture delay circuit, the demodulated single



sideband components in this signal being suppressed and this signal being conveyed through an absolute value-producing circuit.

4,546,379

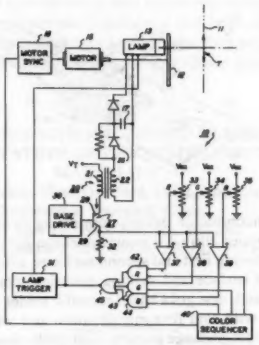
INDEPENDENT COLOR ADJUSTMENT FOR A VIDEO SYSTEM

Joseph J. Sarofeen, Auburn, N.Y., and David M. Fischer, Waltham, Mass., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Apr. 21, 1983, Ser. No. 487,070

Int. Cl.⁴ H04N *9/04*

U.S. Cl. 358—42 **7 Claims**



1. In a video system wherein a target is imaged during each video field by illuminating the target sequentially with light of different primary colors, apparatus for adjusting the intensity of light used to illuminate the target for each primary color that includes

a flash lamp having means for ionizing a fill gas contained in the lamp and a capacitor for discharging through the ionized gas to produce a flash whose intensity is proportional to the charge on the capacitor,

a color wheel for passing a series of primary color filters between the lamp and target whereby the target is illuminated once with light of each primary color,

a flyback transformer having a primary winding connected between a voltage source and the collector of a transistor and a secondary winding connected to the lamp capacitor for charging the capacitor when the transformer is deenergized,

a sensing resistor connected between the emitter of the transistor and ground whereby voltage dropped over the resistor is proportional to the current flow through the primary winding of the transformer,

a plurality of comparators that are equal in number to the number of primary colors, each comparator having a first input terminal connected over the sensing resistor and a

second input terminal connected to a potentiometer, each of said comparators being arranged to provide a zero output signal when the sensed voltage equals the potentiometer voltage,

gating means for applying the output signal of each comparator to the base of the transistor to turn the transistor off when the gated signal goes to zero,

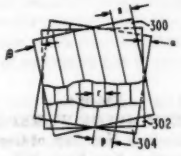
a control means for enabling the gating means in a timed sequence with each video field whereby the intensity of the lamp is controlled during each imaging cycle and a lamp trigger means for ionizing the lamp gas each time the transistor is shut off.

4,546,380

SOLID-STATE COLOR-ENCODING TELEVISION CAMERA

Karl H. Knop, Zurich, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 24, 1983, Ser. No. 526,088
Int. Cl.⁴ H04N *9/04, 9/07, 9/09*
U.S. Cl. 358—43 **2 Claims**



1. A solid-state, color-encoding television camera including:

a solid state imager comprised of a periodic spatial pattern of light-sensing cells, said pattern including a given spatial period p_0 of a set of a predetermined plural number of contiguous light-sensing cells, said spatial period p_0 being oriented substantially parallel to a first axis;

an objective lens situated at a distance from said imager for imaging light of wavelength λ from a scene on said cells of said imager, said objective lens having an f-number F_0;

a periodic color-encoding filter having a given spatial period s that is an integral proportion of said given spatial period p_0, said given period s being comprised of a plurality of different colors each of which corresponds to a separate element of said set of a predetermined plural number of contiguous light-sensing cells, said given spatial period s being oriented substantially parallel to a second axis, and said filter being situated between said objective lens and said imager at a distance (a+b) from said imager; and

a lenticular array comprising periodic lenslets having a given spatial period r that is a given proportion of said given spatial period s of said filter, said given spatial period r being oriented substantially parallel to a third axis, and said array being situated at said distance (a) from said imager and at said distance (b) from said filter;

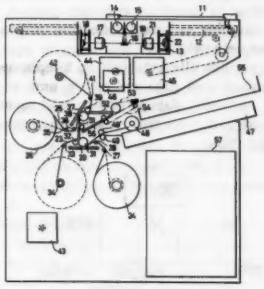
wherein (1) said second axis is rotated in a first direction through an angle β with respect to said third axis, (2) said first axis is rotated in a second direction opposite to said first direction through an angle α substantially equal to $\alpha\beta/b$ with respect to said third axis, and (3) the respective values of β, F_0, λ, p_0, s and r are so related that β is in the range of $0<\beta p_0 \leqq \lambda F_0$, and cos β is substantially equal to $\frac{1}{2}(r/s+s/r-rs/p_0^2)$, and $1/r-1/s<1/p_0$.

4,546,381

MULTI-FUNCTION COPYING MACHINE

Masami Kurata, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,323
Claims priority, application Japan, Mar. 8, 1982, 57-35174
Int. Cl.⁴ H04N *1/46*
U.S. Cl. 358—78 **11 Claims**



1. A multi-function copying machine comprising:

reading section means for reading data on an original by raster scanning and producing electrical picture signals for each color scanned;

recording means for performing recording at different recording positions, said recording means receiving said picture signals and applying said picture signals, representing each color scanned for multi-color recording, to a recording media;

control means for controlling the timing of delivery of said picture signals applied to said recording means;

editing means for selectively actuating said reading section means and for setting the timing of the delivery of a portion of said picture signals provided by said reading section means to said recording means, for editing picture data of the original; and

memory means for delaying the timing of delivery of said portion of said picture signals provided by said reading section means to said recording section as a function of the timing of the delivery set by said control means and said editing means.

4,546,382

TELEVISION AND MARKET RESEARCH DATA COLLECTION SYSTEM AND METHOD

William J. McKenna, Barrington; Kenneth W. Silvers, Frankfort, both of Ill.; Rand B. Nickerson, Scarborough; Russell J. Welsh, Toronto, both of Canada; Harold R. Walker, Edison, N.J.; Joseph A. Cullity, Jersey City, N.J., and Bohdan Stryzak, Bridge Water, N.J., assignors to CTBA Associates, Cincinnati, Ohio

Continuation-in-part of Ser. No. 502,654, Jun. 9, 1983,. This application Dec. 8, 1983, Ser. No. 559,459
Int. Cl.⁴ H04N *7/02*
U.S. Cl. 358—84 **27 Claims**

1. In a system for collecting data with respect to cooperating television viewers or panelists, including a central location and a plurality of remote units at a plurality of panelist locations, a remote unit for connection to a television broadcast receiver comprising:

receiving means for receiving a television broadcast signal;

a viewer control means including

a channel selector coupled to said means for receiving a television broadcast signal;

a data collection unit for coupling said receiving means to the television broadcast receiver, said data collection unit

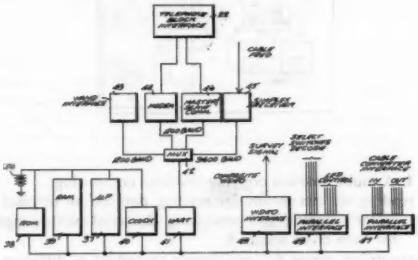
including a microprocessor and memory means for storing programming information for said microprocessor and for storing data;

said viewer control means being monitored by said microprocessor which stores data representing the state of said viewer control means in said memory means;

an optical reader associated with said data collection unit and for use by a panelist to scan data, said data being stored in said memory means under control of said microprocessor;

means for coupling said data collection unit to the switched telephone network; and

means for periodically establishing telephone communication between said data collection unit and the central location, whereby data stored in said memory means is transferred under control of said microprocessor to the central location.



24. A method of collecting data from a plurality of cooperating panelists at a plurality of remote locations comprising the steps of:

providing at each remote location receiving means for receiving a television broadcasting signal for use with an associated television broadcast receiver;

providing at each remote location a viewer control means coupled to the receiving means including at least a channel selector;

providing at each remote location an optical reader for use by a panelist to scan data;

monitoring the viewer control means and storing data indicative of changes therein; and

periodically establishing telephone communications between a central location and each of the remote locations for transferring stored data with respect to the viewer control means and data optically scanned by a panelist to the central location.

4,546,383

METHOD AND APPARATUS FOR VISUAL TELECOMMUNICATIONS, IN PARTICULAR FOR USE BY THE DEAF

Jean-Francois Abramatic, Noisy le Roi; Morton Nadler, La Celle Saint Cloud, and Philippe Letellier, Versailles, all of France, assignors to INRIA Institute National de Recherche en Informatique et en Automatique, Le Chesnay, France

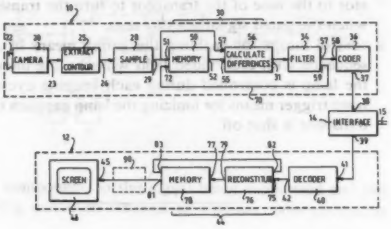
Filed Jun. 17, 1983, Ser. No. 505,309

Claims priority, application France, Jun. 18, 1982, 82 10759

Int. Cl.⁴ H04N *7/14*

U.S. Cl. 358—85 **19 Claims**

1. In an apparatus for generating signals in real time representative of visual information, in particular visual information relating to movements of the human body, the apparatus being of the type comprising: a camera suitable for forming successive images and for converting each such image into a sequence of corresponding electrical signals; binary conversion means for converting the signal representative of each point in the sequence into binary form; and encoding means for encoding the resulting sequences of binary signals, the improvement which includes means for compressing said signals to a data rate compatible with transmission over an ordinary telephone line by virtue of said binary conversion means which link the camera to the encoding means, said means for compressing



comprising means responsive to changes in brightness between neighboring points within each image to extract contours present in the original image, said binary signals then being representative of said extracted contours.

4,546,384

TEST METHOD FOR WORKPIECES

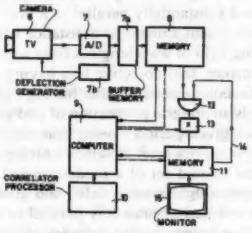
Günter Kowalski, Pinneberg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,978

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111728

Int. Cl.⁴ H04M *7/18*

U.S. Cl. 358—107 **10 Claims**



1. A method for testing an object moving past a stationary electronic camera which records a sequence of images of said object comprising:

generating relevant measurement values of said object by said stationary electronic camera,

storing said measurement values of said object in an electronic memory,

applying said measurement values to an evaluation device,

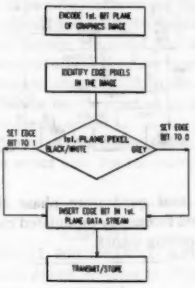
superposing measurement values associated with the same object points by reading and combining measurement values associated with different images of said same object, and

applying superposed measurement values to an image display device.

4,546,385
DATA COMPRESSION METHOD FOR GRAPHICS IMAGES

Dimitris Anastassiou, Long Island City, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,837
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—133 **8 Claims**


ENCODE 1st. BIT PLANE OF GRAPHICS IMAGE
IDENTIFY EDGE PIXELS IN THE IMAGE
SET EDGE BIT TO 1
1st. PLANE PIXEL BLACK/WHITE GREY
SET EDGE BIT TO 0
INSERT EDGE BIT IN 1st. PLANE DATA STREAM
TRANSMIT/STORE

1. A method for compressing data representing a graphics image encoded in binary form having at least first and second bit planes respectively containing a most significant bit and at least significant bit for each pixel in the image indicating whether the pixel has an extreme intensity value or one of two intermediate intensity values, comprising the steps of:

identifying edge pixels from the change in value of the binary state of successive bits in said first bit plane of said image;

generating at least a single binary bit for each adjacent edge pixel so identified;

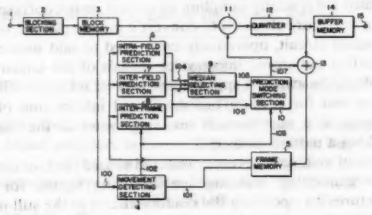
comparing the bits in the first and second bit planes for each of said edge pixels to determine the binary state of each of said binary bits generated, for indicating by said state whether each edge pixel has an extreme intensity value or an intermediate intensity value; and

replacing said second bit plane with said indicative binary bits to compress the image data.

4,546,386
ADAPTIVE PREDICTIVE CODING SYSTEM FOR TELEVISION SIGNALS

Shuichi Matsumoto, Ichigayata; Yoshinori Hatori, Kawasaki; Hitomi Murakami, Yokohama, and Hideo Yamamoto, Sagamihara, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,293
Claims priority, application Japan, Jan. 25, 1982, 57-8825
Int. Cl.[4] H04N 7/12
U.S. Cl. 358—136 **2 Claims**



1. An adaptive predictive coding system for television signals, comprising:

a storage section having a capacity large enough to store input television signals of at least one frame at all times;

a blocking section for producing from the television signals a block to be coded including a plurality of picture elements;

a movement detecting section for setting a standard block of the same shape as the block in a frame immediately preceding a current field of the block at a position spatially corresponding to the block, for reading out of the storage section picture elements included in each of reference blocks obtained by moving the standard block by at least one picture element and in the standard block and for selecting one of the reference blocks and the standard block as a most approximate block each picture element of which is most approximate in luminance to each picture element included in the block of the current field;

an intra-field predicting section for producing a prediction value of each picture element included in the block to be coded through using picture elements present in the current field;

an inter-field predicting section for producing a prediction value of each picture element included in the block to be coded through using picture elements present in the current field and the immediately preceding field;

an inter-frame predicting section for producing a prediction value of each picture element included in the block to be coded through using picture elements present in the current field and the immediately preceding field and included in the most approximate block;

a median selecting section for comparing the prediction values from the three predicting sections in terms of magnitude with one another and for selecting therefrom the prediction value assuming a median;

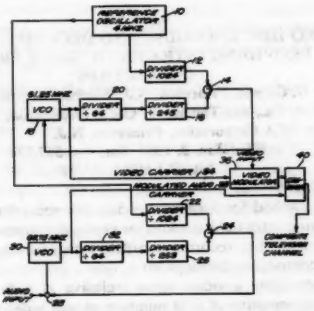
a prediction mode switching section for adopting, as the prediction value of each picture element included in the block to be coded, the prediction value from the inter-frame predicting section or the prediction value from the median selecting section depending on whether the most approximate block is the standard block or the reference block; and

a coding section for predictive-coding the block to be coded determined by the blocking section, through using the prediction value from the prediction mode switching section.

4,546,387
CIRCUIT FOR PROVIDING ACCURATELY SPACED VIDEO AND SOUND CARRIERS

Joseph B. Glaab, New Hope, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,227
Int. Cl.[4] H04N 7/06
U.S. Cl. 358—186 **17 Claims**



1. A circuit for producing a modulated audio carrier and a

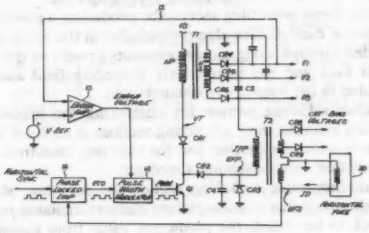
modulated video carrier at accurately spaced first and second respective different frequencies, said circuit comprising a first phase-locked loop for producing said modulated audio carrier signal, a second phase-locked loop for producing a video carrier signal, each of said first and second phase-locked loops including a common reference oscillator, said first phase-locked loop including means for combining an audio carrier signal with an audio input, thereby to form said modulated audio carrier, and further comprising second means for modulating said video carrier signal with a video input, thereby to form said modulated video carrier, and means for operatively combining said modulated audio and video carrier signals to produce a composite television signal including the frequency-spaced modulated audio and video carriers.

4,546,388

POWER SUPPLY FOR CRT TERMINAL

Errol R. Williams, Jr., Round Rock, Tex., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Dec. 20, 1982, Ser. No. 451,081
Int. Cl.⁴ H04N *3/18*
U.S. Cl. 358—190 **11 Claims**



1. A power supply for a CRT terminal responsive to a widely varying input power, comprising:

magnetic yoke means for deflecting a beam of said CRT;

low voltage means coupled to said input power, said low voltage means for generating a plurality of power outputs;

high voltage means for generating a sawtooth waveform suitable for driving said magnetic yoke means, said high voltage means deriving power from said low voltage means;

controlling means coupled to said high voltage means and said low voltage means, said controlling means controlling said high voltage means and said low voltage means, such that at least one of said plurality of power outputs and said waveform remain unaltered as said input power varies.

4,546,389

VIDEO DISC ENCODING AND DECODING SYSTEM PROVIDING INTRA-FIELD TRACK ERROR CORRECTION

Walter G. Gibson, Princeton, N.J.; Michael A. Plotnick, Southampton, Pa., and Thomas Y. Chen, Flemington, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 3, 1984, Ser. No. 567,524
Int. Cl.⁴ H04N *5/781*
U.S. Cl. 358—342 **4 Claims**

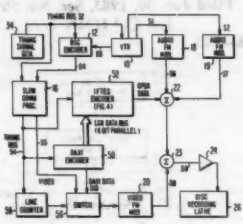
1. A method for forming a video disc recording signal for facilitating intra-field track error correction upon subsequent playback of disc records recorded with said disc recording signal comprising the steps of:

(a) providing a video signal inclusive of a data sequence representative of field numbers of said video signal;

(b) providing a subset of said data sequence representative of track identification numbers;

(c) encoding said subset of said track identification numbers by quadrature phase shift keying a carrier wave;

(d) frequency modulating a second carrier wave with said video signal;



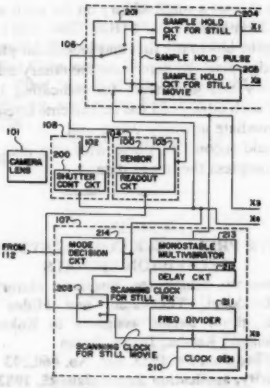
(e) combining said quadrature phase shift keyed carrier wave with said frequency modulated carrier wave to form said disc recording signal.

4,546,390

COMBINATION STILL AND MOTION PICTURE ELECTRONIC CAMERA/RECORDER

Masahiro Konishi, Minami-ashigara, and Makoto Murakoshi, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 28, 1982, Ser. No. 392,520
Claims priority, application Japan, Jun. 29, 1981, 56-101059
Int. Cl.⁴ H04N *5/78*
U.S. Cl. 360—10.3 **4 Claims**



1. A combination still and motion picture electronic camera/recorder comprising:

a sensor for spatially sampling an optical image corresponding to picture elements to convert it into an electric signal;

a readout circuit, operatively connected to said sensor, for reading out stored information signals of the sensor at a still-mode scanning speed in the case of taking a still picture and for reading out the stored information of the sensor at a movie-mode scanning speed in the case of taking a motion picture;

a control unit, operatively connected to said readout circuit, for generating scanning synchronizing signals for still pictures for operating the readout circuit at the still-mode scanning speed and scanning synchronizing signals for motion pictures for operating the readout circuit at the movie-mode scanning speed;

a mode select unit, operatively connected to said readout

circuit and said control unit, for sending to the recording unit, in accordance with the scanning synchronizing signals for still pictures, information signals corresponding to all picture elements in the case of signals being read out from the sensor by the readout circuit at the still-mode scanning speed and for sending to the recording unit, in accordance with the scanning synchronization signals for motion pictures, information signals such that at least one of the number of picture elements per frame and the number of quantized bits per picture element is smaller than the number of picture elements per frame and/or the number of quantized bits per picture element in the case of taking a still picture when the information signals are read out from the sensor by the readout circuit at the movie-mode scanning speed; and

a recording unit, operatively connected to said control unit and said mode select unit, for recording signal at a fixed speed.

4,546,391

VIDEO SIGNAL RECORDING APPARATUS

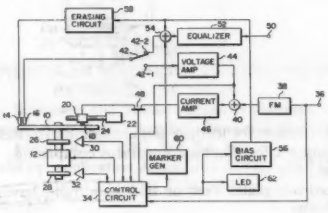
Kenji Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 462,888

Claims priority, application Japan, Feb. 4, 1982, 57-16645; Feb. 4, 1982, 57-16646

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 360—19.1 **6 Claims**



1. A video signal recording apparatus for recording a video signal of a still image and a time-base compressed audio signal relating to the still image on a disc-shaped recording medium with a plurality of concentric tracks, which comprises:

means for rotating the recording medium at a first speed during a first period and a second speed faster than the first speed during a second period, the ratio of the first speed to the second speed corresponding to a ratio of a time-base compression of the audio signal;

first recording means for recording an audio signal on a first track of the recording medium during the first period; and

second recording means for reproducing the recorded audio signal from the first track, and for recording the reproduced audio signal together with a video signal of a still image on a second track of the recording medium other than the first track, during the second period.

4,546,392

INFORMATION RECORDING AND REPRODUCING APPARATUS

Yoshihiro Tokuume, Tokyo, and Hideaki Sato, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 413,990

Claims priority, application Japan, Sep. 12, 1981, 56-144271

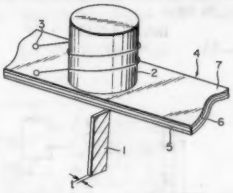
Int. Cl.⁴ G11B *5/04*

U.S. Cl. 360—30 **7 Claims**

1. Information recording and reproducing apparatus, comprising:

transmission means including recording/reproducing means having at least one frequency incapable of producing an output other than a direct current component;

transformation means for transforming a first data sequence including information at frequencies higher than the frequency incapable of producing an output into a second



data sequence, in accordance with the frequency characteristics of said transmission means, and for supplying the second data sequence to said transmission means; and

means for restoring the first data sequence from a third data sequence provided ater transmission by said transmission means.

4,546,393

DIGITAL DATA TRANSMISSION SYSTEM WITH MODIFIED NRZI

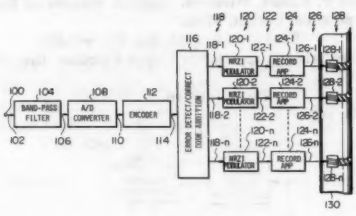
Takaro Mori; Susumu Saito, both of Sagamihara, and Yasuhiko Fujii, Yamato, all of Japan, assignors to Victor Company of Japan Limited, Yokohama, Japan

Filed Feb. 2, 1983, Ser. No. 463,083

Claims priority, application Japan, Feb. 10, 1982, 57-20372

Int. Cl.⁴ G11B *5/09*

U.S. Cl. 360—40 **5 Claims**



1. A magnetic recording method which records digital data on a magnetic recording medium after modulation the digital data by the NRZI (Non-Return-to-Zero Inverted) system and causes the modulated data to be read from the recording medium, timed to magnetic flux reversal caused by the recorded data on the recording medium, comprising the steps of:

(a) encoding the digital data before the NRZI modulation to convert at least part of "false" bits contained in the digital data into "true" bits; and

(b) demodulating the NRZI modulated data which is read from the recording medium and then decoding the demodulated data;

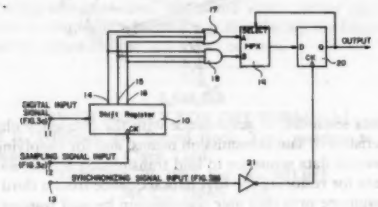
step (a) comprising a step of leaving MSB (Most Significant Bit) of the digital data as it is while converting a logical value of each of the other bits, the bit next to MSB over to LSB (Least Significant Bit), by obtaining XOR (Exclusive OR) based on a logical value which is the inverted version of a logical value of MSB;

step (b) comprising a step of leaving MSB of the modulated digital data as it is while re-converting the converted logical value of each of the other bits, the bit next to MSB over to LSB, by obtaining XOR based on a logical value which is the inverted version of a logical value of MSB.

4,546,394
SIGNAL RECONSTRUCTION CIRCUIT FOR DIGITAL SIGNALS

Takaaki Yamamoto, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1983, Ser. No. 461,306
Claims priority, application Japan, Jan. 29, 1982, 57-13109; Jan. 19, 1983, 58-7085
Int. Cl.⁴ G11B *5/09*
U.S. Cl. 360—53 **7 Claims**

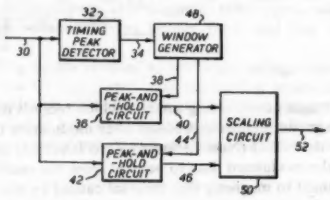


1. A digital signal reconstruction circuit comprising means for reproducing a digital signal recorded on a recording medium by sampling the digital signal at a plurality of points and when a sampled digital signal differs in content from a preceding sample of the digital signal at any of the plurality of points, the different signal is regarded as correct data and thus reproduced, while when such a different signal does not exist at any of the plurality of points, the same signal as the preceding signal is regarded as being correct data and thus reproduced.

4,546,395
DIFFERENTIAL SIGNAL DECODERS

Graham P. Sellars, Winsford, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 8, 1982, Ser. No. 447,833
Claims priority, application United Kingdom, Dec. 11, 1981, 8137549
Int. Cl.⁴ G11B *21/10, 5/02*
U.S. Cl. 360—77 **12 Claims**



1. A demodulator for demodulating servo signals recovered from a moving medium by a transducer wherein the direction and distance of displacement from central disposition over the medium of the transducer is indicated by the sense and magnitude of the difference between first and second position indicating signals recovered from the medium by the transducer and scaled as if their sum were equal to a predetermined value, said demodulator including a first detector in receipt of said first position-indicating signal from said transducer and operable to provide an output indicative of the the magnitude thereof and a second detector in receipt of said second position-indicating signal from said transducer and operable to provide an output indicative of the magnitude thereof, said demodulator comprising;

a differential signal decoder comprising;

a logarithmic converter coupled to receive said outputs of said first and second detectors as respective first and second input signals and operable to provide a logarithmic output signal proportional to the logarithm of the ratio between said first and second input signals, and

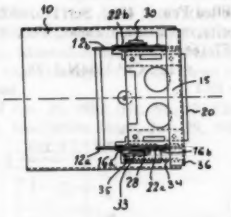
an antilogarithmic converter coupled to receive said logarithmic output signal and operable to respond thereto to control first and second convertor output signals for the ratio therebetween to be equal to the ratio between said first and second input signals and for the sum of said first and second converter output signals to be equal to said predetermined value, where,

the difference between said first and second convertor output signals is coupled as the output of said demodulator.

4,546,396
LOADING AND UNLOADING SYSTEM FOR RECORDING AND/OR PLAYBACK APPARATUS

Etienne A. Schatteman, Wemmel, Belgium, assignor to Staar, S. A., Belgium

Filed Oct. 27, 1982, Ser. No. 437,189
Claims priority, application Belgium, Nov. 9, 1981, 0/206482; Apr. 23, 1982, 0/207911
Int. Cl.⁴ G11B *15/00, 17/00*
U.S. Cl. 360—96.5 **12 Claims**



1. Mechanism for loading and unloading cassettes or discs in recording and/or playback apparatus comprising:

a main frame;

spaced side plates fixed on said main frame having inverted L slots;

a movable frame between said side plates providing a magazine for a cassette or disc;

lateral members on said movable frame engaged in said inverted L slots;

movable side plates associated with said fixed side plates and mounted on said main frame for rectilinear movement, said movable side plates having inclined slots receiving said lateral members; and

means interconnecting said movable side plates for movement in unison, the inclined slots in said movable side plates acting to guide said lateral members and said movable frame in a path defined by said inverted L slots between ejected and operating positions of said cassette or disc.

4,546,397
FLEXIBLE MAGNETIC DISC CASSETTE

Shojiro Asami, and Hiroshi Sumihiro, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,224
Claims priority, application Japan, Dec. 3, 1981, 56-193626
Int. Cl.⁴ G11B *5/012, 23/02*
U.S. Cl. 360—99 **7 Claims**

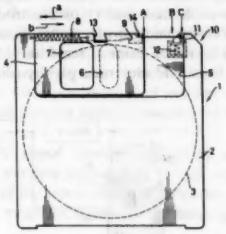
1. A flexible magnetic disc cassette for use with a disc drive comprising:

a cover having upper half and lower half for containing said flexible magnetic disc therebetween;

an access hole provided on said cover for exposing a portion of said flexible magnetic disc for recording and/or reproducing;

a shutter slidably mounted on said cover for selectively closing

said access hole, said shutter being positionable at respective closed position, non-locked operative position and locked operative position;



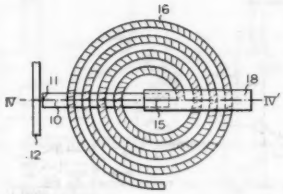
a lock member provided on said cover for locking said shutter at said locked operative position, and said access hole being shielded by said shutter until said shutter is moved to said non-locked operative position from said closed position.

4,546,398

PERPENDICULAR MAGNETIC RECORDING AND REPRODUCING HEAD

Junzo Toda, Kawasaki, and Masao Hiyane, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 30, 1982, Ser. No. 403,727
Claims priority, application Japan, Jul. 3, 1981, 56-118525
Int. Cl.⁴ G11B *5/16, 5/20*
U.S. Cl. 360—126 **14 Claims**



1. A perpendicular magnetic recording and reproducing head for recording information on and reproducing information from a recording medium having a recording surface, comprising:

a first thin magnetic film in substantially perpendicular relation with the recording surface, the first thin magnetic film having a first end, adjacent to the recording surface, which generates a magnetic flux perpendicular to the surface of the recording medium for recording and reproducing information and a second end;

a second thin magnetic film having a first portion in substantially parallel relation with the first thin magnetic film and a second portion connected to the second end of the first thin magnetic film; and

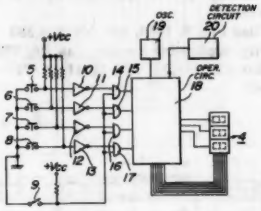
a thin film coil, disposed in a plane which is substantially parallel to the first thin magnetic film and the first portion of the second thin magnetic film, the thin film coil having a center adjacent to the second end of the first thin magnetic film.

4,546,399

TAPE RECORDER

Kenji Furuta, Hachioji, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 286,389, Jul. 24, 1981, abandoned, which is a continuation of Ser. No. 968,743, Dec. 13, 1978, abandoned. This application Mar. 8, 1984, Ser. No. 586,645
Claims priority, application Japan, Dec. 13, 1977, 52-167362[U]
Int. Cl.⁴ G11B *27/34*
U.S. Cl. 360—137 **8 Claims**



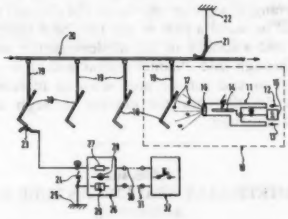
1. A tape recorder comprising an operating section for performing a plurality of functions including, a recording-playback function and a plurality of other functions, an indicating section for indicating data from one of the functions performed, a plurality of input means for constraining said operating section to cause said indicating section to indicate data from one of said plurality of other functions, actuating means for individually and selectively actuating one of said input means, and disabling means coupled to each of said input means for simultaneously disabling operation of each of said input means so that said recording-playback function is undisturbed.

4,546,400

METHOD AND APPARATUS OF PROTECTING A COATING PLANT AGAINST EXPLOSION

Walter Holl, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,762
Int. Cl.⁴ B05B *5/02*
U.S. Cl. 361—1 **16 Claims**



1. A method of protecting a plant for coating objects with particles against explosion by sparkovers obtained through electric charging of the objects, wherein the objects are connected to a first earth connection via holding means, the method comprising the steps of:

applying sucessively a test high voltage between one of the objects and a second earth connection when the respective object closes the circuit for preventing between the object and/or the holding means and the first earth connection the generation of an electric arc of an energy higher than a permitted maximum energy, wherein an insulation occurring between the object and/or the hold-

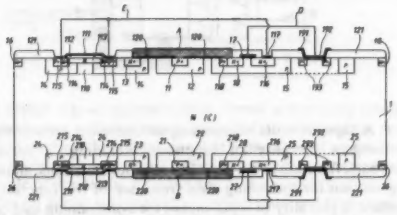
ing means and the first earth connection and having a contact resistance smaller than a permitted maximum value is overcome by an arcthrough of low energy; and measuring the current flowing in the closed circuit for determining the contact resistance of the insulation wherein the plant is stopped only when the actual value of the current is below a minimum value because the contact resistance is above the permitted maximum value.

4,546,401

TWO-POLE OVERCURRENT PROTECTION DEVICE

Per Svedberg, Vällingby, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 8, 1984, Ser. No. 578,383
Claims priority, application Sweden, Jan. 16, 1983, 8300853
Int. Cl.⁴ H02H 7/20; H01L 29/74
U.S. Cl. 361—91 **7 Claims**



1. A two-pole overcurrent protection device for connection into a current-carrying conductor which device comprises

a normally conducting turn-off thyristor having a semiconductor body with, in successive order, a first emitter layer, a first base layer, a second base layer and a second emitter layer,

an MOS transistor integrated with the thyristor and connected in parallel with a PN junction of the turn-off thyristor existing between the first emitter layer and the first base layer, which MOS transistor is arranged, when the voltage across the turn-off thyristor exceeds a predetermined value, to short-circuit the said PN junction and cause the turn-off thyristor to cease conducting,

characterized in that

the said turn-off thyristor is arranged to be supplied with a gate trigger current via a channel region with the same conduction type as the second base layer of the thyristor and arranged adjacent this layer, the channel region being located between a part of the first base layer of the thyristor and a surface of the semiconductor, whereby current through said channel region will flow substantially parallel to said surface and, with an increasing voltage across the thyristor the current through said channel region is limited.

4,546,402

HERMETICALLY SEALED GAS TUBE SURGE ARRESTER

Alwyn A. deSouza, and Andreas J. Eggendorfer, both of Goleta, Calif., assignors to Joslyn Mfg. and Supply Co., Chicago, Ill.

Filed Aug. 29, 1983, Ser. No. 526,987
Int. Cl.⁴ H02H 9/06
U.S. Cl. 361—120 **17 Claims**

1. A hermetically sealed gas tube surge arrester comprising

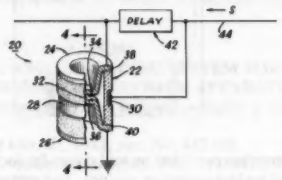
a first gap electrode,

a second gap electrode,

an electrode gap formed between and defined by the most closely spaced portions of said gap electrodes,

an elongated insulating spacer disposed between said gap electrodes, said first gap electrode being hermetically sealed to one longitudinal end of said spacer and said second gap electrode being hermetically sealed to an opposite longitudinal end of said spacer and said electrode gap being interiorly disposed within said spacer,

a third electrode physically disposed about the outer periphery of said spacer and along the length of said spacer between said one and said opposite longitudinal ends of said spacer such that said third electrode is physically spaced apart from said gap electrodes by said spacer and is electrically insulated from at least one of said gap electrodes and from said electrode gap by said spacer, and



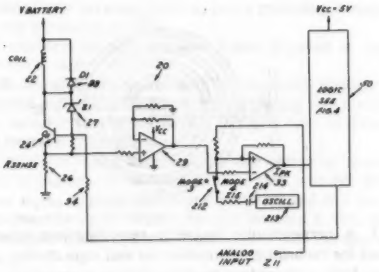
preconditioning means electrically connected between said first gap electrode and said third electrode for enabling an impulse voltage surge to be applied to said third electrode prior to being applied across said gap electrodes and for preconditioning said electrode gap to sparkover at a lower impulse breakdown voltage than would be required to cause said electrode gap to sparkover in the absence of said preconditioning means.

4,546,403

SOLENOID SWITCHING DRIVER WITH SOLENOID CURRENT PROPORTIONAL TO AN ANALOG VOLTAGE

Arnold D. Nielsen, Wayne, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 2, 1984, Ser. No. 585,717
Int. Cl.⁴ H01H 47/32
U.S. Cl. 361—154 **5 Claims**



1. A solenoid driver circuit for controlling application of current to a solenoid providing force as a linear function of applied current and for reducing power dissipation, said solenoid driver circuit including:

a transistor means having a collector-emitter current path for completing one series current path through the solenoid;

a diode coupled in series with said collector-emitter current path of said transistor means for providing a parallel current path for the solenoid;

a sense resistor coupled in series with said collector-emitter path of said transistor means for sensing current in the solenoid;

a Zener diode coupled between said transistor means collector and base to provide voltage protection for said transistor means;

a comparator means coupled to said sense resistor to compare a function of the voltage sensed across said sense resistor to an analog voltage;

logic means coupled to said comparator means and said transistor means so as to receive input signals which are a function of the solenoid current and the analog voltage for switching said transistor means on and off as a function of the output of said comparator means so there is a period wherein solenoid driving current rises to a peak current and decays for a predetermined amount of time, the sustaining peak current being a function of the analog voltage; and

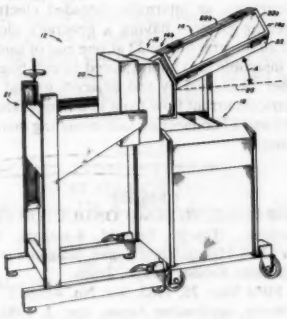
an oscillatory signal source coupled to said comparator means for varying said analog voltage input to minimize hysteresis of the solenoid due to striction of the coil mechanism and magnetic hysteresis by keeping the solenoid in motion.

4,546,404

STORAGE UNIT FOR AN INTEGRATED CIRCUIT TESTER

Nicholas J. Cedrone, Wellesley Hills, and Kenneth R. Lee, Lincoln, both of Mass., assignors to Daymarc Corporation, Waltham, Mass.

Filed May 23, 1983, Ser. No. 497,272
Int. Cl.[4] H05K *7/14*
U.S. Cl. 361—331 **18 Claims**



1. Storage means for a tester of integrated circuits comprising,

a set of elongated guideways that can each hold a plurality of integrated circuits in a relatively loose, end-to-end abutting alignment,

a frame that carries said guideways, said frame having a central axis of rotation and said guideways being arrayed about said axis of rotation,

wherein said guideways are each rotatable with respect to said frame about their own longitudinal axis,

means rotating said frame in a step-wise manner about said axis of rotation through a preselected number of angular positions that include a load position where integrate circuits can be loaded into one of said guideways and a feed position where integrated circuits are discharged from of said guideways, and

means maintaining said guideways at a substantially constant angular orientation with respect to the horizontal as said frame rotates through said angular positions,

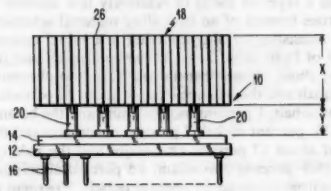
wherein said central axis and said guideways are inclined with respect to the horizontal so that integrated circuits are loaded into and fed from said guideways using the force of gravity

4,546,405

HEAT SINK FOR ELECTRONIC PACKAGE

Eric B. Hultmark, Wappingers Falls; Claude G. Metreaud, Fishkill, and Robert A. Yacavonis, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1983, Ser. No. 497,781
Int. Cl.[4] H01L *23/36*
U.S. Cl. 361—386 **9 Claims**



1. In an electronic semiconductor package having a substrate with at least one integrated circuit semiconductor device mounted thereon, and a lid element forming with the substrate an enclosure for the said semiconductor device, the improvement comprising:

a heat dissipating assembly mounted on said lid that includes

a plurality of pins made of heat conductive material affixed to said lid,

cooling fin structure mounted on said plurality of pins, said fin structure comprised of a thin walled cellular structure with of tubular cells open at both ends arranged in side by side relation,

said cells of said thin walled cellular structure are of a honeycomb structure with each cell having an even number of sides of equal length,

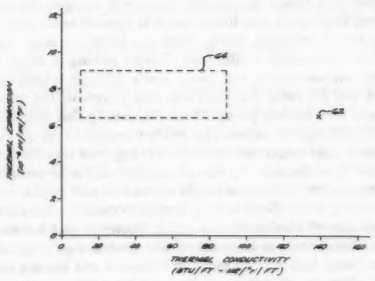
said plurality of pins seated in a plurality of said cells of said fin structure, the relationship serving as a means to mount said fin structure on said package in heat conducting relationship.

4,546,406

ELECTRONIC CIRCUIT INTERCONNECTION SYSTEM

Thomas S. Spinelli, Attleboro, Mass.; William G. Manns, and Donald F. Weirauch, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 438,137, Nov. 1, 1982, Pat. No. 4,472,762, which is a division of Ser. No. 191,039, Sep. 25, 1980, Pat. No. 4,385,202. This application May 7, 1984, Ser. No. 602,792
Int. Cl.[4] H05K *1/03*
U.S. Cl. 361—386 **1 Claim**



1. An electronic circuit comprising a substrate having a plurality of circuit means arranged in spaced electrically insulated relation to each other and electronic semiconductor

means mounted on the substrate electrically interconnected with the circuit path means, the semiconductor means having portions formed of inorganic material having selected thermal expansion properties and having metal conductors fixedly connected in electrically conductive relation to the circuit path means, and the substrate means comprising a flat, composite metal laminate having a plurality of symmetrically disposed layers of different metal materials metallurgically bonded together, said metal laminate including a layer of metal of relatively high thermal conductivity formed of a copper material and a layer of metal of relatively low thermal expansion properties formed of an iron alloy material selected from the group consisting of alloys having a nominal composition by weight of from about 36 to 50 percent nickel and the balance iron, of about 31 percent nickel, 8 percent chromium, 8 percent cobalt and the balance iron, of about 32 percent nickel, 15 percent cobalt, 1 percent molybdenum and the balance iron, of about 38 percent nickel, 7 percent chromium and the balance iron, of about 17 percent chromium and the balance iron, of about 16.5 percent chromium, 4.5 percent aluminum, and the balance iron, of about 57 percent cobalt, 9 percent chromium and the balance iron, and of about 23 to 30 percent nickel, about 17 to 30 percent cobalt about 0.6 to 0.8 percent manganese and the balance iron, the relative thickness of said metal layers being selected so that the composite metal laminate has thermal expansion properties substantially corresponding to those of glass and alumina materials and has significantly higher thermal conductivity properties than said glass and alumina materials as indicated in FIG. 23.

4,546,407

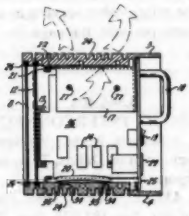
HEAT EXCHANGING ELECTRONIC MODULE HOUSING

Salvatore Benenati, 77 Woodside Dr., Red Bank, N.J. 07701

Filed Oct. 31, 1983, Ser. No. 547,116

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **7 Claims**



1. Electrical apparatus including an assembly of a main chassis and plural plug-in electronic modules that characteristically develop heat when in operation, said main chassis having upper and lower horizontal walls and upright side members fixing said upper and lower walls in spaced-apart relation, said electronic modules being received between said upper and lower horizontal walls, said chassis having a front opening between said upper and lower walls through which said modules are movable for insertion and removal, the top of said upper wall having parallel heat-dissipating fins extending side-to-side along the chassis and freely exposed to the air above the chassis, said electronic modules having heat-transfer structures at the tops thereof, the top of each of said heat transfer structures and the bottom or inside surface of said upper wall being in sliding and effective heat-transfer contact with each other, guiding and biasing means acting between said lower wall of the chassis and the bottoms of said modules guiding said modules along fore-and-aft paths of insertion and biasing said modules upward, thereby pressing the tops of said heat-transfer structures in effective heat-transfer contact with the bottom or inside surface of said upper wall, said electronic modules including respective upper rearward-extending elements, and a formation depending from the bottom or inner surface of said upper wall and extending side-to-side along the upper wall and hence parallel to said heat dissipating fins, said depending formation opening forward and being shaped complementary to said elements of said modules and being in retentive cooperation therewith, said upper wall having the form of an extrusion whose fore-and-aft vertical cross-sectional profile is intersected by said fins, said bottom or inner surface of the upper wall and said depending formation of said upper wall.

4,546,408

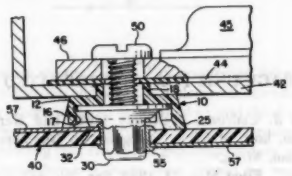
ELECTRICALLY INSULATED HEAT SINK ASSEMBLIES AND INSULATORS USED THEREIN

William G. Rodseth, Elgin, and Francis C. Peterson, St. Charles, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed May 16, 1983, Ser. No. 495,324

Int. Cl.⁴ H05K *7/20*

U.S. Cl. 361—386 **5 Claims**



1. A fastener for use in attaching components to and electrically isolating components from an electrically conductive support comprising, an internally threaded electrically conductive fastening element having a generally elongated nut body **30** and an integral flange **32** at one end of said body, said body being insertible into an apertured circuit board, an insulating member **10** carried by and adjacent to said flange preventing electrical current flow from said flange, and preassembly means, **16** and **17** connecting said insulating member to said fastening element.

4,546,409

DEVICE FOR COOLING SEMICONDUCTOR ELEMENTS

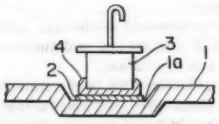
Souichi Yoshino, Himeji; Tadashi Kusanagi, Kobe, and Masakazu Mori, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,073

Claims priority, application Japan, Apr. 2, 1982, 57-56249; Apr. 2, 1982, 57-56250; Apr. 2, 1982, 57-56251; Apr. 2, 1982, 57-56252

Int. Cl.⁴ H01L *25/12;* **H05K** *7/20*

U.S. Cl. 361—387 **6 Claims**



6. A combined semiconductor element and a cooling device therefor, comprising:

a cooling plate for cooling semiconductor elements, said plate being made of an aluminum material taken from the group consisting of aluminum and aluminum alloy and having recessed portions therein; and

a preformed semiconductor element-mounting sheet which is made of an aluminum material taken from the group consisting of aluminum and aluminum alloy, said sheet having on one surface thereof a metal layer other than the metal of said mounting sheet and a preformed solder layer on the outer surface of said metal layer, and the other

surface of said sheet being ultrasonically welded in an aluminum material to aluminum material bond to the aluminum material of said mounting sheet in a recessed portion of said cooling plate; and

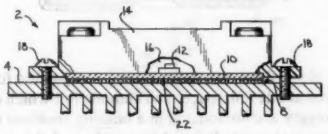
a semiconductor element soldered to said mounting sheet by said solder layer.

4,546,410

CIRCUIT PACKAGE WITH MEMBRANE, CONTAINING THERMOCONDUCTIVE MATERIAL, RUPTURED AGAINST A HEAT SINK

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Filed Oct. 31, 1983, Ser. No. 547,031
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—387 **8 Claims**



6. A circuit package mounted to a heat sink, comprising:

an electrically insulative thermally conductive substrate;

circuit means on the top side of said substrate;

an electrically insulating housing covering said substrate and circuit means; and

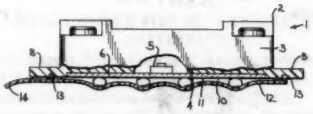
membrane means containing thermoconductive material adhesively stuck to the bottom side of said substrate and rupturing against said heat sink to spread said thermoconductive material along the interface of said heat sink and said bottom side of said substrate.

4,546,411

MOUNTING OF A COMPACT CIRCUIT PACKAGE TO A HEAT SINK OR THE LIKE

Lance R. Kaufman, 131 N. White Oak Way, Mequon, Wis. 53092

Filed Oct. 31, 1983, Ser. No. 546,999
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—387 **4 Claims**



1. A compact circuit package mounted in heat transferring relation to the wall of a heat sink, comprising, in combination:

(a) a housing having a cavity containing heat generating electrical components,

(b) the lower portion of said housing providing a peripheral rim surrounding said cavity,

(c) an electrical insulating heat conducting substrate surrounded by said rim and closing said cavity,

(d) a bubble of plastic film secured to said housing and overlying said substrate, said housing with said film forming an enclosed chamber,

(e) heat transferring grease disposed in said chamber for spreading in a layer onto said substrate upon the application of external pressure to said film,

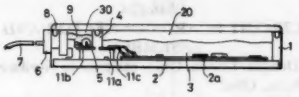
(f) said film being removable from said housing so that said layer of grease on said substrate is exposed in subsequent contact with the wall of said heat sink.

4,546,412

ELECTRONIC DEVICE FOR AUTOMOBILE

Terumi Nakazawa, Naka; Hitoshi Minorikawa, Mito, and Kazuhiko Kawakami, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1984, Ser. No. 609,835
Claims priority, application Japan, May 12, 1983, 58-83362
Int. Cl.⁴ H05K *5/02*
U.S. Cl. 361—395 **9 Claims**



1. An electronic device for an automobile comprising:

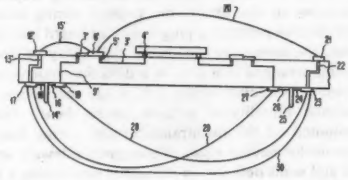
a casing sealed with a cover and which is divided into first and second compartments by a partition; lead frames mounted in said partition; a control circuit substrate mounted in said first compartment, connected to one side of said lead frames, and covered with a gel material; and individual parts mounted in said second compartment, connected to the other side of said lead frames, and covered with a rubbery material.

4,546,413

ENGINEERING CHANGE FACILITY ON BOTH MAJOR SURFACES OF CHIP MODULE

Irving Feinberg; Charles J. Kraus, both of Poughkeepsie, and Herbert I. Stoller, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,277
Int. Cl.⁴ H05K *7/06*
U.S. Cl. 361—410 **3 Claims**



1. A circuit module having circuit means on one major surface thereof and terminal means on the other surface thereof,

a first selectively disconnectable delete line on said one surface,

a second selectively disconnectable delete line on said other surface,

a first conductive pathway extending through said module from said first delete line to said second delete line,

said first conductive pathway and said delete lines being connectable in series circuit between said circuit means and said terminal means

a third selectively disconnectable delete line on said other surface of said module, and

a second conductive pathway extending through said module from said one surface of said module to said third delete line,

said second conductive pathway and said third delete line being connectable in series circuit between said one surface and said terminal means,

said second conductive pathway being connected to said circuit means and said terminal means when said third

delete line is unbroken and at least one of said first and second delete lines are broken,

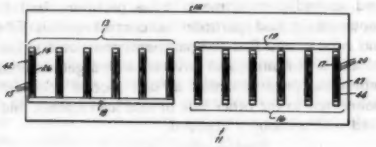
said second conductive pathway being disconnected from at least one of said circuit means and said terminal means when both said first and second delete lines are unbroken.

4,546,414

PLUG-IN CIRCUIT BOARD CONNECTOR AND KEYING ASSEMBLY

William E. Donges, Lorain, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Apr. 12, 1983, Ser. No. 482,281
Int. Cl.⁴ H05K *1/14*
U.S. Cl. 361—413 **19 Claims**



1. A mainframe printed wiring board assembly for receiving plug-in circuit boards of two different types in connectors correct for only one or the other type of circuit board, comprising:

a mainframe printed wiring board;

a first plurality of plug-in circuit board connectors mounted on the mainframe printed wiring board, each connector having a pair of elongated sidewalls and a pair of end walls defining an elongated slot having a principal direction and including means for establishing electrical connections to the mainframe printed wiring board from conductive paths on a plug-in circuit board inserted in the slot, the connectors in the first plurality of connectors being arranged in a row in a direction transverse to the principal direction of the slots in the connectors;

a second plurality of plug-in circuit board connectors mounted on the mainframe printed wiring board, each connector having a pair of elongated sidewalls and a pair of end walls defining an elongated slot having a principal direction and including means for establishing electrical connections to the mainframe printed wiring board from conductive paths on a plug-in circuit board inserted in the slot, the connectors in the second plurality of connectors being arranged in a row in a direction transverse to the principle direction of the slots in the connectors;

a first elongated key element extending parallel to the direction in which the row of connectors in the first plurality of connectors is arranged and positioned at a first location relative thereto; and

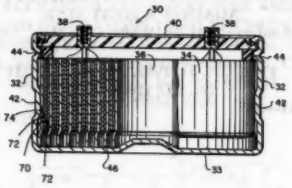
a second elongated key element extending parallel to the direction in which the row of connectors in the second plurality of connectors is arrranged and positioned at a second location relative thereto, the positioning of the first key element relative to the first row of connectors differing from the positioning of the second key element relative to the second row of connectors, whereby a plug-in circuit board having an edge contoured to fit into the slot of a connector in one plurality of connectors and to accommodate its associated key element cannot be placed in the slot of a connector in the other plurality of connectors due to interference between said circuit board edge and the other key element.

4,546,415

HEAT DISSIPATION ALUMINUM ELECTROLYTIC CAPACITOR

Thomas A. Kent, Irmo, and Jesse S. Shaffer, Columbia, both of S.C., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 329,367, Dec. 10, 1981,. This application Mar. 27, 1984, Ser. No. 593,226
Int. Cl.⁴ H01G *9/00*
U.S. Cl. 361—433 **1 Claim**



1. An electrolytic capacitor having a capacitor foil roll of interleaved anode foil, spacer and cathode foil which capacitor roll is snuggly accommodated in a housing enclosed by means of a cover, said anode foil and said cathode foil being electrically connected to the corresponding terminals in said cover, characterized in that:

said capacitor foil roll has a ratio of anode foil width to foil roll diameter of 1 to 2 or greater;

the cathode foil layer of said capacitor foil roll extending below said anode foil and said spacer, the lower edges of said cathode foil engaging and being force fitted against the base of said housing for the conduction of heat from said foil to the base of said housing;

a circumferential compressible pad positioned between the cover of said housing and the top of said foil roll to maintain downward pressure on said foil roll; and

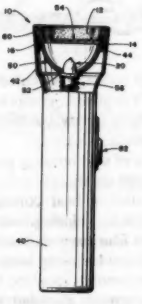
the diameter of said foil roll being increased and the height of said foil roll being decreased within said ratio to provide optimal axial heat dissipation for a given capacitance and power level.

4,546,416

PHOSPHORESCENT FLASH-LIGHT

J. C. Pemberton, P.O. Box 20005, San Diego, Calif. 92120

Filed Jan. 30, 1984, Ser. No. 575,243
Int. Cl.⁴ F21V *9/16*
U.S. Cl. 362—84 **4 Claims**



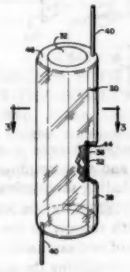
1. A portable flashlight comprising:

a casing having a flared opening at one end and closed at the other end for holding a battery;

a reflector dish having a light bulb positioned at its base, said

dish placed into the open end of said casing for reflecting the light from said bulb whenever said bulb is energized;
a lens placed against the face of said reflector for dispersing the light emitting from said energized bulb;
a bezel attached around said lens having a rim containing a phosphor material and extending forwardly of said lens in position to receive light from said bulb, thereby to charge said phosphor material whenever said bulb is energized, whereby the flashlight may be visually located in a dark area when said bulb is not energized.

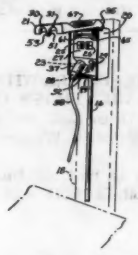
4,546,417
SELF-LUMINOUS LIGHT SOURCE
David J. Watts, Benton, Pa., assignor to Safety Light Corporation, Bloomsburg, Pa.
Filed Jul. 19, 1983, Ser. No. 515,067
Int. Cl.⁴ F21V *9/16*
U.S. Cl. 362—84 **8 Claims**



1. A self-luminous light source comprising:
inner and outer glass tubes of substantially equal length, placed within one another to define an elongated axial space within the inner tube and an elongated annular space between the inner and outer glass tubes;
annular glass end members extending between the inner and outer glass tubes at opposite ends thereof, the end members and coaxial tubes entirely closing the elongated annular space;
a phosphor coating on at least one surface of the inner and outer tubes; and,
a radioactive gas disposed in the elongated annular space.

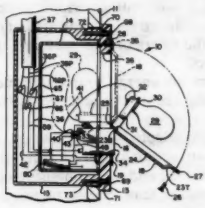
4,546,418
MINI CENTER FOR ELECTRICAL POWER DISTRIBUTION
Horacio Baggio, Niles; George R. Eckart, Evanston, both of Ill., and Louis A. DeBeradinis, Stamford, Conn., assignors to Woodhead Industries, Inc., Northbrook, Ill.
Continuation of Ser. No. 523,048, Aug. 15, 1983, abandoned.
This application Oct. 10, 1984, Ser. No. 659,506
Int. Cl.⁴ F21V *33/00*
U.S. Cl. 362—85 **10 Claims**

1. In a power distribution center assembly for outdoor use in distributing electrical power to electrical equipment, the combination comprising: a housing having a forward open end and a cover pivotally mounted at one edge of said housing for hinging movement between a closed position in which said cover closes the open end of said housing and an open position for permitting access within said housing; a cover plate mounted in said housing at least one electrical receptacle mounted on said cover plate within said housing and adapted to receive a plug of an electrical power cord associated with said electrical equipment; said receptacle being enclosed within said housing and said power cord passing through an aperture in said housing when said cover is in its closed position; said receptacle being exposed for access when said cover is in its open position; and illuminating means mounted within said housing, said cover including a downwardly and rearwardly sloped surface having a slot defining a light port in said cover adjacent to said illuminating means wherein when said cover is in its closed position, light diffused through the light port in said cover is transmitted downwardly and illuminates a



front portion of the power distribution center assembly and areas beneath the assembly, and when said cover is in its open position, light from said illuminating means directly illuminates the forward open end of said housing and said receptacle mounted within said housing.

4,546,419
WALL RECEPTACLE RECESSED BOX CONTAINED LIGHT INTENSITY ON/OFF CONTROLLED NIGHT LIGHT SYSTEM
Kelli J. Johnson, 318 Bluebonnet Trail, Garland, Tex. 75043
Filed Nov. 5, 1984, Ser. No. 668,145
Int. Cl.⁴ F21V *33/00*
U.S. Cl. 362—95 **14 Claims**



1. A wall receptacle recessed box light intensity on/off controlled night light comprising: a night light with night light bulb and control circuitry contained in a night light box receivable in a wall receptacle recessed box in its operational state; a face plate covering the opening in the wall of the wall receptacle receiving said night light box; a light transmitting cover mounted on said face plate and enclosing an opening in said face plate; a photocell for dusk/dawn on/off switching control of said night light-box mounted in said face plate for sensing the intensity of light impinging on said face plate; signal intensity trigger circuit means responsive to the electrical signal generated by said photocell for on/off switching control of power to said night light bulb; and power supply means connected to said signal intensity trigger circuit means; wherein said face plate is fastened to a wall by screw fastening means; said light transmitting cover is part of a cover structure pivotally mounted on the bottom to said face plate and fastened to the face plate at the top by screw fastening means in the closed state; an inwardly extended flange, including a bulb socket thereon extending inwardly from and a part of said cover structure to mount a light bulb thereon such that the bulb is lifted up and out through the opening in said face plate when

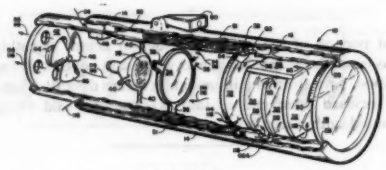
said light transmitting cover with said cover structure is pivoted to the open state when said screw fastening means is removed from the face plate; and wherein said socket for said light bulb is connected to common-ground; and a metal contact mounted in said night light box positioned to be engaged by the bottom contact of said light bulb when the light bulb is pivoted down to the operational position when said light transmitting cover with said cover structure is pivoted to the closed state.

4,546,420

AIR COOLED LIGHT FIXTURE WITH BAFFLED FLOW THROUGH A FILTER ARRAY

David C. Wheeler, San Diego, Calif., and Douglas H. Blakeway, Lansley, Canada, assignors to Wheeler Industries, Ltd., San Diego, Calif.

Filed May 23, 1984, Ser. No. 613,329
Int. Cl.[4] F21V *9/08*
U.S. Cl. 362—268 **20 Claims**



1. a light fixture for providing energy in narrow spectral range which comprises:

an elongated housing having openings at each end thereof;

a plurality of spaced apart filters in a pack positioned at the first end of said housing, the front most filter of said pack enclosing and sealing said first end of said housing to the passage of exterior atmosphere air therethrough, the others of said plurality of spaced apart filters having at least a portion of their outer periphery removed and are rotationally positioned to provide at least one tortuous air path between the filters of said pack and the atmosphere exterior thereof;

a broad spectrum energy source intermediate to the ends of said housing adapted to emit energy toward said filter pad; and

cooling means adapted to circulate exterior atmospheric air between an opening spaced from the first end of said housing and the end of said housing opposite said first end through said at least one tortuous air path and past said energy source,

whereby energy absorbed in said housing, energy source and filter pack is removed by the circulation of said air.

4,546,421

FLYBACK FEEDFORWARD PULSE WIDTH MODULATION REGULATOR

Vincent G. Bello, and Charles W. Sweeting, both of Norwalk, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 28, 1984, Ser. No. 594,136
Int. Cl.[4] G05F *1/46*
U.S. Cl. 363—21 **6 Claims**

1. A feedforward circuit including a circuit input and a circuit output for a pulse width modulated DC power supply, comprising:

transformer means for modifying current and voltage levels; including primary and secondary sides each including input and output sides;

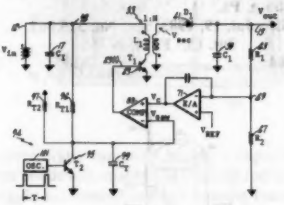
switching means including input, output and control sides, for passing power through said primary side in successive on and off states;

diode means for transferring current with respect to said circuit outputs, said secondary side and said diode means being electrically connected in series, and said diode means being reverse biased during the on states of said switching means;

capacitor means for storing charge, including respective output and grounded sides, the output side of said capacitor means being electrically connected at the circuit output;

sampling means for sampling a selected portion of the output voltage at said circuit output;

error means including an error output for establishing an error difference between said selected portion of said output voltage and a selected reference voltage;



sawtooth means for establishing a sawtooth waveform of characteristic slope and peak amplitude;

comparator means including sawtooth and error inputs and an output, for controlling the on and off times of said switching means with respect to the difference between the respective levels of said sawtooth and error inputs; and

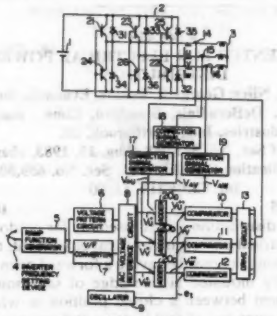
feedforward means for modifying the magnitude of the slope and peak amplitude of the sawtooth waveform, whereby said feedforward means is effective for precisely modifying the duty cycle of said switching means.

4,546,422

CONTROL SYSTEM FOR A VOLTAGE-TYPE INVERTER

Chihiro Okado, Fuchu, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1983, Ser. No. 564,677
Claims priority, application Japan, Dec. 28, 1982, 57-228061
Int. Cl.[4] H02M *7/537*
U.S. Cl. 363—41 **10 Claims**



1. A control system for a voltage-type inverter which comprises a bridge connection of electric valves each comprising a reverse parallel connection of a semiconductor switching element and a diode, and which converts DC power to AC power by means of pulse width modulation control, said control system comprising:

means for generating an AC voltage reference,

means for generating a triangular wave signal,

means for comparing the AC voltage reference and the triangular wave signal to produce pulse width modulation outputs,

a drive circuit responsive to the pulse width modulation outputs for driving the electric valves, the drive circuit including means for ensuring a dead time by which turn-on of one of the electric valves is delayed after turn-off of another electric valve connected in series with said one of the electric valves,

detection means for detecting the direction of current through each valve, and

compensating means for compensating, in accordance with the result of the detection, variation in an output voltage which depends on the direction of the output current and on the dead time, by modifying the voltage reference in a direction to compensate the variation in the output voltage.

4,546,423

MULTIPLE INVERTERS WITH OVERCURRENT AND SHOOT-THROUGH PROTECTION

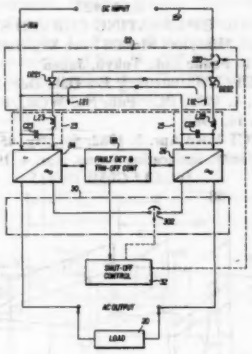
Nagataka Seki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 15, 1983, Ser. No. 466,541

Claims priority, application Japan, Feb. 23, 1982, 57-26817; Jun. 25, 1982, 57-109533

Int. Cl.⁴ H02H *7/122*

U.S. Cl. 363—56 **17 Claims**



2. A multiple inverter comprising:

input shut-off means for receiving a DC energy input of the multiple inverter and providing two or more DC outputs wherein said input shut-off means includes at each DC input circuit of said unit inverters a unidirectional current conductor, each of said urdirectional current conductors allowing a current of said DC energy input to pass therethrough but blocking a current from one of said unit inverters to another unit inverter;

two or more unit inverters coupled to said input shut-off means for respectively converting said DC outputs into two or more AC outputs, each of said unit inverters including switching elements; and

control means coupled to at least one of said unit inverters for detecting an accidental or faulty overcurrent due to a shoot-through of said switching elements and for turning off said unit inverter, wherein a current path of said DC energy input is interrupted by said input shut-off means when the control means detects said accidental overcurrent.

4,546,424

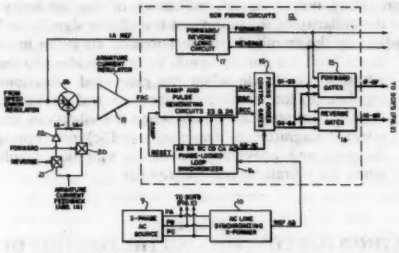
COMPENSATED RAMP GENERATING CIRCUIT FOR CONTROLLING SCR FIRING

Dennis C. Nolan, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 14, 1983, Ser. No. 532,065

Int. Cl.⁴ H02P *13/26*

U.S. Cl. 363—87 **3 Claims**



1. A circuit for automatically regulating ramp signals generated in response to an AC line frequency of either 50 or 60 hertz, the circuit comprising:

an integrating circuit with an operational amplifier, with a capacitor connected between an output and an inverting input of the operational amplifier, and with biasing means coupled to the operational amplifier to charge the capacitor and generate a ramp signal at the output of the operational amplifier;

reset means, coupled across the capacitor and responsive to a signal synchronized to the AC line frequency, for discharging the capacitor and generating ramp signals at a frequency related to the AC line frequency; and

compensation means, coupled in parallel with the capacitor and coupled to the output of the operational amplifier, for adjusting charging current to the capacitor in response to variations in average value of voltage across the capacitor, to compensate for variations in line frequency.

4,546,425

PROCEDURE AND DEVICE FOR OPTIMATION OF THE VIBRATION AMPLITUDE IN VIBRATORY ROLLERS

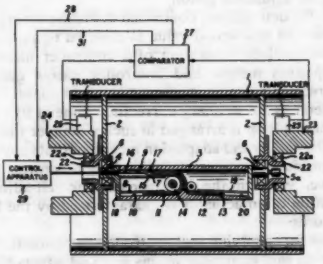
Claes Breitholtz, Lyckeby, Sweden, assignor to Dynapac Maskin AB, Solna, Sweden

Filed Mar. 24, 1983, Ser. No. 478,275

Claims priority, application Sweden, Apr. 1, 1982, 8202103

Int. Cl.⁴ B06B *1/16;* **E01C** *19/28*

U.S. Cl. 364—153 **15 Claims**



1. A method for providing optimal compaction of various materials by an adjustable amplitude vibratory roller comprising the steps of:

disposing at least two transducers at selected locations on elements vibrated by the vibratory roller;

generating signals representative of the vibrations of said elements, the locations of said transducers being selected to provide signals of similar waveform when the vibrations generated by the vibratory roller are regular and signals of dissimilar waveform when the vibrations generated by the vibratory roller are irregular, the dissimilarity being a measure of the magnitude of the difference between the vibrations;

comparing the transducer signals;

providing output signals indicative of the similarity and dissimilarity of the compared transducer signals; and

adjusting the amplitude of vibrations of the roller in accordance with the output signals by (a) providing increasing vibration amplitude when the generated vibrations are regular, (b) interrupting the increase and providing decreasing vibration amplitude when the vibrations reach a selected magnitude of irregularity and (c) interrupting the decrease and providing increasing vibration amplitude when the vibrations become regular.

4,546,426

METHOD FOR CONTROLLING THE POSITION OF AN ACTUATOR IN A MANNER WHEREBY THE ADJUSTMENT IS ADAPTIVE

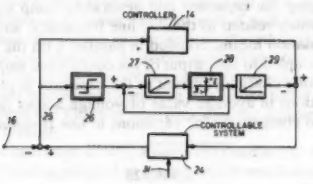
Günther Häfner, Stuttgart; Karl-Ernst Noreikat, Esslingen; Hans-Dieter Schmidt, Wendlingen; Ulrich Letsche, and Bernhard Bauer, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 1, 1983, Ser. No. 470,973

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207392

Int. Cl.⁴ G05B *13/04*; G05D *7/06*

U.S. Cl. 364—153 **20 Claims**



11. An arrangement for self-adjusting the position of an actuator with the following features:

an actuator including an electrohydrolic servo valve which drives a working cylinder connected thereto;

a measured value transmitter connected to an adjustable piston of the working cylinder, said transmitter generating an actual value determined as a function of the movement of said adjustable piston;

means for determining controlled deviation from a required value and said actual value as directed to a control loop;

the control loop consisting of a controller means and an adaptation means, said controller means generating a correcting value at its output and said adaptation means generating an auxiliary correcting value at its output,

the control loop is arranged in such a manner that the controller means and adaptation means' outputs are combined to produce a correcting value which controls the servo valve, wherein the arrangement for self-adjusting the position of an actuator is characterized by the following features:

a means for supplying said controlled deviation to the inputs of both said controller means and said adaptation means,

said adaptation means including a non-linear element in series with first integrator means and hysteresis means, the output of said hysteresis means providing the input to a second integrator means in addition to providing a negative feedback signal from its output to the input of the first integrator means, said second integrator means thereby providing the output of said adaptation system, said adaptation means thereby transforming said controlled deviation into said auxiliary correcting value;

output means connected to said controller means and said adaptation means for combining their outputs to form said single correcting value.

20. A method of controlling the position of an actuator having the steps of generating a signal indicative of an actuator position, generating a signal indicative of a desired actuator position, comparing the actuator position signal to the desired actuator position signal, generating an error signal from the comparison, providing the error signal to a controller, generating an adaptation signal in an adaptation system, generating a control signal in the controller, combining the control signal with the adaptation signal to provide an adapted control signal, and providing the adapted control signal to said actuator to control it, wherein the step of generating an adaptation signal comprises the steps of providing the error signal to the adaptation system, generating a signum function in response to the error signal, providing the signum function to an arithmatic point, integrating the signal at the arithmetic point, operating on the integral with a hysteresis function, providing the result of the hysteresis operation to the arithmatic point, and integrating the result of the hysteresis operation to provide the adaptation signal.

4,546,427

METHOD OF CREATING CURVED SURFACES

Hajimu Kishi, Hino, and Masaki Seki, Suginami, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

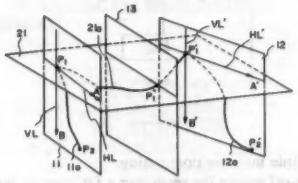
PCT No. PCT/JP82/00105, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982, PCT Pub. No. WO82/03475, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 5, 1982, Ser. No. 451,146

Claims priority, application Japan, Apr. 4, 1981, 56-050968

Int. Cl.⁴ G05B *19/415*

U.S. Cl. 364—168 **9 Claims**



1. A method of forming a workpiece to have a curved three dimensional shape, said method comprising

providing at least three curves representing respective portions of said shape in respective sections, including at least one given section curve in a respective given section and at least one reference curve each in a respective reference section, and partitioning information for partitioning said first reference curve,

partitioning said first reference curve on the basis of said partitioning information at respective partitioning points,

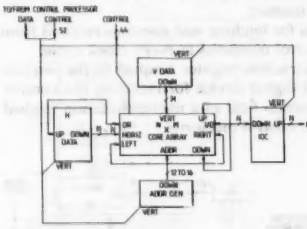
determining each of a plurality of intermediate sections and respective intermediate section curves, each said intermediate section curve containing a respective one of the partitioning points, and

forming said workpiece to have said shape by moving a cutting tool along paths corresponding to said intermediate section curves in the respective intermediate sections.

4,546,428
ASSOCIATIVE ARRAY WITH TRANSVERSAL HORIZONTAL MULTIPLEXERS

Steven G. Morton, Oxford, Conn., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Mar. 8, 1983, Ser. No. 473,364
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 10 Claims

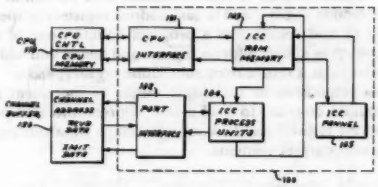


1. In an associative array processor having a plurality of processor cells, the improvement comprising a transversal horizontal multiplexer associated with each of said processor cells.

4,546,429
INTERACTIVE COMMUNICATION CHANNEL

Robert H. G. Chan, Mt. Laurel Township, Burlington County; Martin R. Mann, Princeton Township, Mercer County, and John A. Ciarrocchi, Haddon Heights Borough, all of N.J., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 387,581, Jun. 11, 1982, abandoned. This application Dec. 27, 1984, Ser. No. 686,954
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 8 Claims



1. In combination with an automatic digital telecommunications system having a computer including a central processing unit with a core memory, and a multiplicity of duplex serial data channels, said serial data channels being terminated in a channel buffer, an interactive communications channel providing said central processing unit with multichannel interfaces and message traffic by scanning said multiplicity of serial data channels, in response to instructions from said central processing unit, and sending message traffic to be stored in said core memory when operating in an input mode of operation, and receiving said message traffic from said core memory and transmitting it out over said serial data channels when in an output mode of operation; said interactive communication channel comprising:

a device port interface receiving and transmitting data packets for said multiplicity of serial data channels between said channel buffer and said interactive communications channel;

a central processing unit interface entering and extracting data packets out of said central processing unit's core memory for communication and transfer by said interactive communications channel over said serial data channels; said central processing unit interface having a conditions unit which contains an "activate" bit for each of said serial data channels, each of said "activate" bits capable of being set by a buffer area list entry which is generated by said interactive communications channel to accompany each of said data packets when they are entered into said central processing unit's core memory, each of said "activate" bits being reset by said instructions from said central processing unit which direct said output mode of operation, each of said activate bits also being capable of being reset when queued by its serial data channel in a request for a message;

a memory means, entering and extracting data packets into said central processing unit interface in data blocks which have a size of two bytes, said memory means maintaining a buffer area list entry for each received message said buffer area list entry containing: a one bit signal to set said "activate" bit in said conditions unit in said central processing unit interface; a block byte count which indicates the amount of memory space available in said central processing unit, a data address indicating the planned location of the start of said data packet in the memory space of said central processing unit, and a last block indicator which indicates a planned location of the end of said data packet in the memory space of said central processing unit, said memory means temporarily storing and transferring a cyclic redundancy check for each of said data packets, said cyclic redundancy check being a quality test for transmission errors in said data packets;

a first updating means receiving said block byte count and a memory bus signal from said memory means, said first updating means outputting an updated block byte count to said memory means by incrementing the value of said block byte count by two when said memory bus signal indicates that said interaction communications channel is outputting data from said central processing unit to said serial data channels, and decrementing said block byte count by two when said interactive communications channel is inputting data from said serial data channels into said central processing unit;

a second updating means serving as an elapsed time counter for testing each of said serial data channels to see if a request has been sent for a transmission by documenting a byte count of a programmable number each time an inactive channel is scanned, and testing said "activate" bit for said inactive channel in said conditions unit in said central processing unit interface when said byte count reaches binary zero;

a scan counter sending a start-of-scan signal to said second updating means each time an inactive channel is scanned;

a checking means producing a first checking signal by performing a first cyclic reduncancy check on incoming data packets received from said device port interface, said checking means checking said data packets for errors upon transmission by said interactive communications channel by: receiving said first checking signal and said data packets from said memory means, performing a second cyclic redundancy check, and comparing the results of said second cyclic redundancy check with said firt checking signal, and said checking means sending a second checking signal when the results of said second cyclic redundancy check favorably compare with said first checking signal;

a bit stuffing control means producing an output signal by receiving said data packets from said checking means and stripping all stuffed bits from said data stream when said data stream is being received from said serial data channels, said bit stuffing control means restoring stuffed bits to said data stream when said data stream is being transmitted out to said serial data channels; said bit stuffing control means containing a control bit counter, said control bit counter detecting a flag character in said data packets, said flag character being a particular binary signal

which indicates the conclusion of any message in said data packets, said bit stuffing control means sending its output signal to said memory means with said data packets being received from said serial data channels, said bit stuffing control means sending its output signal to said device port interface when said data packets are being transmitted out said serial data channels.

4,546,430

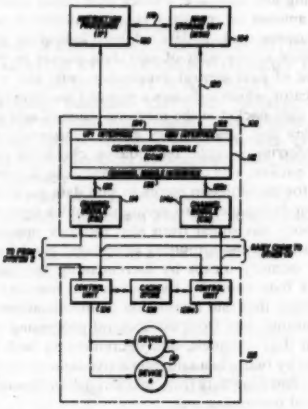
CONTROL UNIT BUSY QUEUING

David J. Moore, Ramsey County; Larry L. Byers, Dakota County; Duane G. Kurth, Anoka County; Donald T. Bordsen; John R. Honkomp, both of Ramsey County; Bruce C. Todd, Anoka County, and Robert M. Malek, Ramsey County, all of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Jul. 13, 1983, Ser. No. 513,051

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—200 **7 Claims**



1. A method of processing commands issued by a central computer complex to a central control module, said commands being passed from said central control module through channel module means to control units for execution thereby, said method comprising:

forming a first queue of commands received by said central control module but not yet passed through said channel module means;

forming a second queue of commands which have been passed through said module means but rejected by one of said control units because it is busy; and,

linking said second queue to the top of said first queue when said one control unit is available to accept a command,

whereby commands rejected by a control unit because it is busy may again be issued to said control unit without interrupting said central computer complex.

4,546,431

MULTIPLE CONTROL STORES IN A PIPELINED MICROCONTROLLER FOR HANDLING JUMP AND RETURN SUBROUTINES

Carlos F. Horvath, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 3, 1982, Ser. No. 438,701

Int. Cl.[4] G06F *09/32, 09/42*

U.S. Cl. 364—200 **10 Claims**

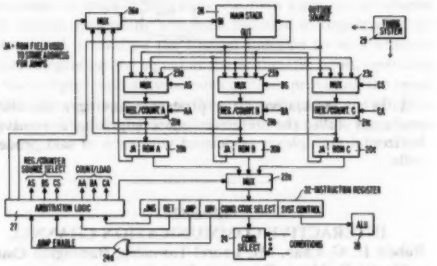
1. A microcontroller for controlling a digital device, said microcontroller comprising:

at least three control memories each for storing a set of microinstructions, each microinstruction being formed of a control field for controlling said digital device, a jump address field specifying the location in other control memory of the next microinstruction to be executed should said each microinstruction be a jump to subroutine or a return from subroutine instruction and an instruction field specifying whether that particular microinstruction is a jump microinstruction, return microinstruction, or requires neither action;

at least three address registers one for each control memory and containing the address of the next microinstruction to be fetched;

means for fetching said microinstructions from each of said control memories in every clock cycle;

an instruction register coupled to the respective memories and digital device for receiving the control field and instruction field of a microinstruction fetched from one of said control memories;



a multiplexor coupled between said instruction register to select the instruction field of one of the microconstructions being fetched from said respective control memories;

interconnection means coupled between each of said control memories and the address registers of the other control memories for supplying a jump address to the address registers of said other control memories;

logic means coupled to said instruction field portion of said instruction register and to said address registers to specify one of said registers as a program counter, one of said registers as a jump address register and one of said address registers as a return from subroutine register; and

means responsive to said logic means to increment said program counter, to load a new address into said jump address register and to keep said return from subroutine register current contents.

4,546,432

PROLOG PROCESSING SYSTEM

Mamoru Umemura, and Minoru Yokota, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,340

Claims priority, application Japan, Aug. 31, 1982, 57-150831

Int. Cl.[4] G06F *9/00, 9/06, 7/00*

U.S. Cl. 364—200 **3 Claims**

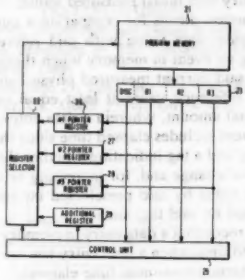
1. A system for executing a Prolog program, said system comprising:

a program memory comprising a plurality of memory addresses for storing entries, respectively, said entries being given in a predetermined number of formats, each entry having first through F-th fields where F represents a preselected natural number which is greater than unity, the F-th fields of said entries representing the formats of the respective entries, the first through the (F-1)-th fields of said entries indicating relationships which each entry has relative to different ones of said entries so that said entries represent said program;

accessing means for accessing said memory addresses one at a time;

first through (F-1)-th poniter registers for storing the first through the (F-1)-th fields of the entry of the memory address accessed by said accessing means as first through (F-1)-th pointers, respectively; and

selecting means responsive to at least the F-th field of said



one entry for selecting one of said pointer registers at a time, said selecting means being coupled to said accessing means to make said accessing means access the memory addresses following the relationships indicated by the pointers of the successively selected ones of said pointer registers.

4,546,433

ARRANGEMENT FOR PROCESSING DATA IN A TWO-DIMENSIONAL ARRAY

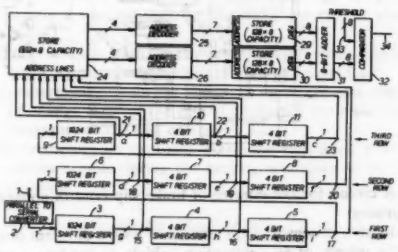
Christopher J. Tucker, Pitsea, England, assignor to GEC Avionics Limited, Rochester, England

Filed Jun. 29, 1982, Ser. No. 393,435

Claims priority, application United Kingdom, Jul. 4, 1981, 8120731

Int. Cl.⁴ G06F *15/16*

U.S. Cl. 364—200 **11 Claims**



1. A data processing arrangement including means for receiving data in the form of a serial stream in which data elements are representative of a two dimensional data array and each data element comprises a plurality of data bits; means for passing the serial stream sequentially in time to a plurality of data access points so that at certain times a particular data bit of a particular data element and data bits of the same corresponding significance of other data elements relating to predetermined positions relative to said particular data element in said two dimensional data array occupy respective access points; means connected to receive the data bits temporarily present at said access points for performing on said particular data bit a selected operation which is at least in part a function of the nature of said bits of said other data elements, to produce a result of the selected operation; and means connected to receive the results produced by performing the selected operation on all of the data bits representing a data element for producing an indication of the result of performing the selected operation on said particular data element as a whole.

4,546,434

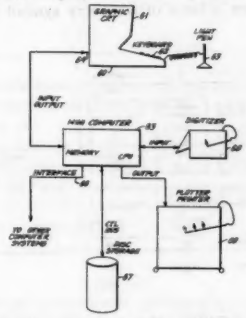
METHOD FOR DESIGNING APPAREL

Debbie A. Gioello, 237 Van Cortlandt Park Ave., Yonkers, N.Y. 10705

Continuation-in-part of Ser. No. 81,569, Oct. 3, 1979, abandoned, and a continuation-in-part of Ser. No. 101,763, Dec. 10, 1979, abandoned. This application Mar. 26, 1982, Ser. No. 362,164

Int. Cl.⁴ G06F *7/30*

U.S. Cl. 364—300 **4 Claims**



1. A method for computer aided design of apparel, comprising the steps of:

providing computer means including visual display means, data input means and printout means for generating a permanent record of computer output;

designing at least one fashion figure on which said apparel design may be selectively and compositely superimposed;

designing a plurality of garment components;

providing a plurality of planar patterns, each of said patterns corresponding to one of each of said garment components;

converting each of said fashion figures, said garment components and said patterns into a form which may be stored, manipulated and output by said computer means;

creating a data base accessible by said computer means containing said converted fashion figures, converted garment components, and converted patterns, said data base linking said converted patterns to said corresponding converted garment components, said data base further linking similar converted garment components into converted garment component classes;

progressively designing apparel by displaying on said visual display means at least one converted fashion figure and superimposing at least one converted garment component selected from said data base on said converted fashion figure display;

outputting to said printout means a reproduction of said visual display means; and

outputting to said printout means a converted pattern retrieved from said data base and corresponding to each of said converted garment components visible on said visual display means.

4,546,435

GRAPHIC COMPUTER SYSTEM AND KEYBOARD

Frank P. Herbert, 2145 Ivy St., and Maxwell K. Barnard, P.O. Box 693, both of Port Townsend, Wash. 98368

Continuation of Ser. No. 147,080, Jun. 24, 1980,. This application Jun. 20, 1984, Ser. No. 622,385

Int. Cl.⁴ G06F *9/00*

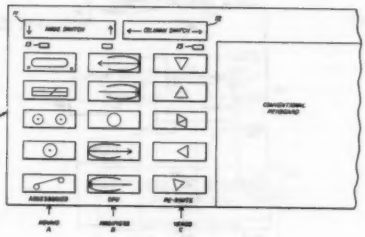
U.S. Cl. 364—300 **3 Claims**

1. A method for entering a source program written in a high

level graphic programming language into a data processing system for use with an interface such as a compiler or interpreter to generate a machine level object program, said data processing system having a standard typewriter style keyboard and a multicolumn graphic keyboard, said method comprising the steps of,

preparing a single path programming flow chart consisting of accessory symbols, CPU symbols and re-route symbols, said preparing step including the steps of choosing selected ones of said accessory symbols, CPU symbols and re-route symbols to define a data processing program and arranging said chosen symbols in a single sequence from a commencement point in said single path flow chart to a termination point in said single path flow chart,

selecting from said multicolumn graphic keyboard, comprising a first column of accessory symbol keys, a second



column of CPU symbol keys and a third column of re-route symbol keys, a first symbol key corresponding to a first symbol in said single path programming flow chart and activating said selected first symbol key, and

selecting and activating, in sequence, subsequent to activation of said first symbol key, keys from said multicolumn keyboard corresponding to each symbol in said single path programming flow chart from said commencement point in said flow chart to said termination point in said flow chart, whereby a user of said data processing system may input a computer program represented by said single path programming flow chart directly into said data processing system by selectively activating accessory symbol keys, CPU symbol keys and re-route symbol keys correponding to said accessory symbols, CPU symbols and re-route symbols chosen for said single-path programming flow chart.

4,546,436

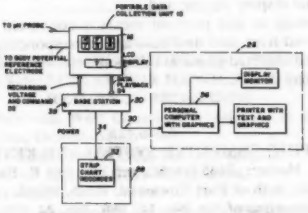
PORTABLE PH DATA COLLECTOR

Wolfger Schneider, Columbia, and Richard J. Johns, Baltimore, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 6, 1983, Ser. No. 511,383

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 364—415 **26 Claims**



1. A physiological data collector for recording physiological data characterized by bursts of rapid activity interspersed among relatively long periods during which there is little or no activity, said physiological data collector comprising:

a data collection means for periodically measuring and digitizing physiological data;

a means for setting a reference value equal to an initial measured value of said physiological data and for recording as a data entry said initial measured value;

a data reduction means for comparing a current measured physiological data value with said reference value, for recording an event in memory when there is a difference between said current measured physiological data value, and said reference value at least equal to a preselected incremental amount, wherein a data entry corresponding to said event includes elapsed time since the last recorded data entry and a tag indicating whether there is a positive or negative change and, for increasing or decreasing said reference value by said preselected incremental amount, as indicated by said tag; and,

a means for recording a data entry in memory and reinitializing elapsed time when a data entry has not been recorded within a certain maximum time elapsed.

4,546,437

METHOD AND CIRCUIT FOR THE CONTROL OF A BRAKE SLIP CONTROL APPARATUS

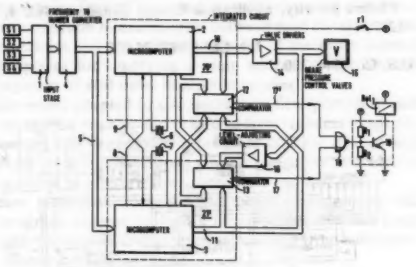
Hans-Wilhelm Bleckmann, Ober-Moerlen; Heinz Loreck; Helmut Fennel, both of Frankfurt am Main, and Michael Zydeck, Glashuetten, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,374

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3234637

Int. Cl.⁴ B60T *8/00*

U.S. Cl. 364—426 **36 Claims**



1. A circuit for the control of brake slip control apparatus comprising:

a plurality of sensors each associated with a different one of the wheels of an automotive vehicle to produce a rotational behavior signal;

at least one converter coupled to said plurality of sensors to convert said plurality of rotational behavior signals to a plurality of binary signals each proportional to an associated one of said rotational behavior signals;

at least two synchronized logic circuits each coupled to said converter to generate independent of each other a plurality of valve control signals in response to said plurality of binary signals, one of said two logic circuits generating said plurality of valve control signals to control said slip control apparatus; and

a plurality of comparators equal in number to said at least two logic circuits, each of said plurality of comparators being coupled to said two logic circuits to compare internal sighals of said two synchronized logic circuits at corresponding locations therein and to compare external signals including signals derived from said plurality of valve control signals and said plurality of valve control

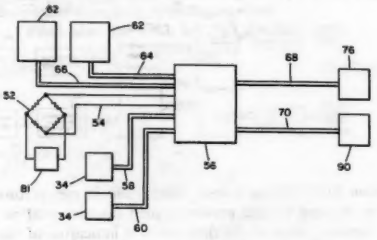
signals to disable said slip control apparatus when a difference between any one of said internal and external signals is detected.

4,546,438

RHEOMETER AND PROCESS OF CURING AND TESTING RUBBER

William T. Prewitt, Tallmadge, and James A. Van Dyke, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 27, 1983, Ser. No. 536,181
Int. Cl.⁴ G06F *15/46*; G01N *3/32*
U.S. Cl. 364—473 **16 Claims**



1. A process of curing and testing a rubber sample comprising:
(a) heating the rubber sample;
(b) making at least a plurality of measurements of the resistances of the rubber sample during heating, to generate a plurality of resistance measurements;
(c) determining, from the resistance measurements, a minimum resistance S_{min};
(d) determining, following S_{min} and from the resistance measurements, the maximum S_{max}' of change of the resistance;
(e) determining, from the resistance measurements, the occurence of a rate of change of the resistance S_{del}' of approximately a selected ratio to the maximum rate of change S_{max}';
(f) determining, from the resistance measurements, the resistance S_{del} at which the rate of change equals S_{del}';
(g) determining, from the resistance measurements, the rate of change S_{del}'' of the rate of change of the resistance in proximity to the rate of change S_{del}';
(h) predicting an expected maximum resistance Y of the rubber sample during the heating according to the relationship

$$Y=S_{del}+(S_{del}'(i-S_{del}'/(S_{del}''\times K)))/2$$

where K is a constant; and
(i) terminating the test and cure based on the expected maximum resistance Y.

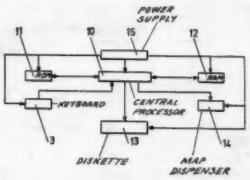
4,546,439

METHOD AND APPARATUS FOR DETERMINING ROUTE FROM A PRESENT LOCATION TO A DESIRED DESTINATION IN A CITY

Natividad Gene Esparza, Bolivia, No. 15, Madrid, Spain

Filed Feb. 28, 1983, Ser. No. 470,132
Claims priority, application Spain, Mar. 10, 1982, 510.299; Jun. 16, 1982, 513.175
Int. Cl.⁴ G06F *15/20*
U.S. Cl. 364—444 **14 Claims**

4. An information station, comprising:
first means for enabling an individual to identify the address of a desired destination, said first means including a keyboard for entering said address, a verification screen for verifying the entered address and erase means for erasing improperly entered addresses;
a read-only memory storing information which identifies all of the addresses of a city and assigns a zone number, to each said address, each zone number defining a zone including a plurality of adjacent addresses;



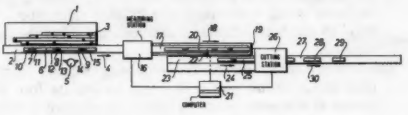
second means for comparing said entered address with said stored information and for displaying a number of corresponding to the zone in which said entered address is located as a function of said comparison;
human actuable means enabling a traveler to enter the zone number of the zone identified by said second means; and
third means for providing a map of the zone corresponding to the zone number entered.

4,546,440

METHOD AND PLANT IN PROCESSING, PARTICULARLY CUTTING UP ELONGATED OBJECTS SUCH AS TIMBER

Ulf Palmberg, Nybro, Sweden, assignor to AB Gustaf Kahr, Nybro, Sweden

Filed Jun. 21, 1983, Ser. No. 506,339
Claims priority, application Sweden, Jun. 23, 1982, 8203915
Int. Cl.⁴ G06F *15/46*; B26D *5/30*
U.S. Cl. 364—475 **9 Claims**

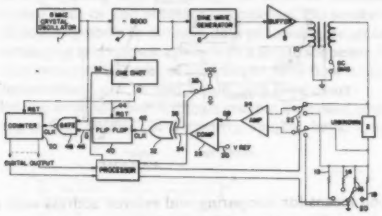


1. A process of cutting up an elongate blank, for example of timber, containing defects, comprising the following steps:
at an inspection station, providing marks on opposite sides of defects in the blank,
transporting said blank through a measuring station while generating a first series of successive pulses representing measurement along said blank and generating signals representing said defect marks, said signals being related to said length measured by said pulses,
feeding said length measurement pulses and said defect marking signals to a computer programmed to count and store said pulses, memorize said signals in relation to said pulse count and to divide lengths between defect marks into optimum numbers of sections or predetermined lengths,
conveying said blank to a cutting station and transporting said blank through said cutting station while generating a second series of pulses representing movement of said blank through said cutting station, said second series of pulses being fed to said computer to count down said first series of pulses stored in said computer, and
controlling cutting means at said cutting station by said computer to cut out said defects and to divide lengths between defects into an optimum number of sections of predetermined lengths.

4,546,441
METHOD AND APPARATUS FOR TIME BASED MEASUREMENT OF IMPEDANCE

John Burch, 18519-64th Place N.E., Seattle, Wash. 98155

Filed Jul. 22, 1982, Ser. No. 400,911
Int. Cl.[4] G01R 27/00
U.S. Cl. 364—482 7 Claims



1. System for automatic time-based measurement of impedance in an electrical unknown component, comprising:

(a) generating circuit means for generating a sine wave signal of desired measurement frequency,

(b) measurement circuit means containing an unknown impedance component and also including reference resistance means in series with said unknown component across which said sine wave signal is simultaneously applied,

(c) comparator circuit means for receiving the signals applied across the unknown component and across the reference resistance means, said signals being amplified to said comparator circuit means such that they are not subjected to phase sensitive detection nor to analog-to-digital conversion, said comparator circuit means also including reference voltage circuit input means for establishing a reference voltage level and further including polarity reversing circuit input means so that sine wave signals applied to said reference resistance means and said unknown component cross and recross in positive going and negative going transistions the defined reference voltage level to produce detectable and measureable time defined signals,

(d) timing circuit means for receiving signals from said generating circuit means in order to initiate four timing cycles at the same point in time, two each of which said four cycle measure lapses of time with respect to transitions of said sine wave signal across said reference voltage level for each of said unknown component and said reference resistance means to thereby enable calculations by a processor means of impedance based on said timing cycles, and to receive time defined signals from said comparator circuit means, and

(e) processor means for reading said time lapses and for calculating impedance in said unknown component.

4,546,442
MICROCOMPUTER CONTROL SYSTEM FOR DESICCANT DRYER

Craig S. Tinker, Ocala, Fla., assignor to Pall Corporation, East Hills, N.Y.

Filed Nov. 24, 1982, Ser. No. 444,502
Int. Cl.[4] B01D 53/04
U.S. Cl. 364—500 7 Claims

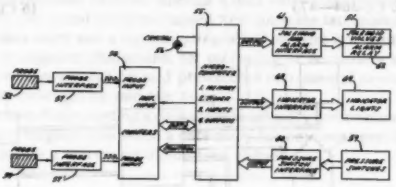
1. A control system for a desiccant gas dryer having a first desiccant bed and a second desiccant bed, gas to be dried being alternately directed by valves to pass through one of the beds providing adsorbtion of vapor while the other desiccant bed is being regenerated or is in an idle condition in response to at least one bed select signal and at least one regeneration enable signal, respectively, energy being required for the regeneration process, the control system comprising, in combination,

a capacitance probe in each desiccant bed so that the level of condensate saturation of the desiccant in each bed is indicated by the capacitance of the respective probe,

at least one oscillator having a frequency setting capacitance input connected to the probe in the desiccant bed having been used for adsorbtion of vapor, so that the oscillator frequency is indicative of the capacitance of the connected probe and thus indicative of whether the desiccant bed needs to be regenerated,

timer means for establishing a predetermined time interval,

means for counting the cycles of the oscillator frequency over said predetermined time interval,



means for obtaining a final count from the means for counting at the end of said predetermined time interval so that the numeric value of the final count is indicative of the level of condensate saturation of the respective desiccant bed, and

a microcomputer executing a stored sequence of instructions, said microcomputer comprising

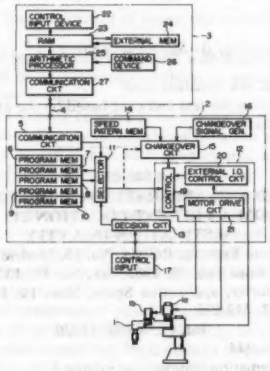
first means for comparing the final count to a predetermined threshold count representative of the condensate saturation level for which regeneration is required, and

means for generating said regeneration enable signal in response to said means for comparing the final count to the predetermined threshold indicating that regeneration is required.

4,546,443
OPERATION CONTROL APPARATUS FOR INDUSTRIAL ROBOT

Yukio Oguchi, and Kazuyoshi Yasukawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Sep. 29, 1982, Ser. No. 428,508
Claims priority, application Japan, Sep. 30, 1981, 56-156625
Int. Cl.[4] G05B 19/18; G06F 15/46
U.S. Cl. 364—513 5 Claims



1. An operation control apparatus for an industrial robot, comprising: an operating program memory; a speed pattern

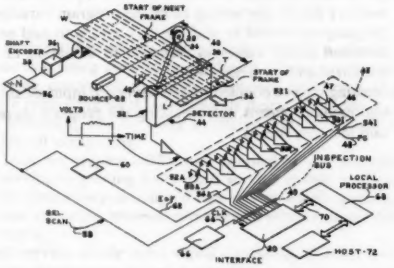
memory for storing a plurality of speed patterns; changeover signal generator means for generating a changeover signal in response to one of a sensed predetermined operating parameter of said industrial robot or operation of a manual switch; changeover circuit means for selecting a speed pattern in response to said changeover signal; and robot drive control unit means for instructing movements of said industrial robot in accordance with a selected operating program read out from said program memory and a speed pattern supplied from said speed pattern memory.

4,546,444

DATA COMPRESSION INTERFACE HAVING PARALLEL MEMORY ARCHITECTURE

David C. Bullis, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 15, 1983, Ser. No. 475,505
Int. Cl.[4] G01N *21/32*
U.S. Cl. 364—550 **27 Claims**



1. An inspection system for inspecting a web subdivisible into a series of frames comprising:

a flying spot generator for generating a flying spot of radiation movable over the web along a plurality of transverse scan paths, each frame comprising a predetermined plurality of scan paths each of which is subdivisible into a number of transversely contiguous lanes;

a detector for generating a pedestal signal representing the radiation transmitted through or reflected by the web;

a discriminator responsive to the pedestal for generating a characteristic signal representative of the presence of a predetermined physical property on the web at a corresponding lane of a scan path; and

first and second serial memories connected in parallel, each memory having a number of stages corresponding to the number of lanes, one memory being selectable during alternate frames as an input memory for storing each characteristic signal in the stage corresponding to the lane in which it was generated to produce an accumulated lane-by-lane summary of the occurrence of the property during a frame, while the other memory is selectable as an output memory from which the summary produced during the preceding frame is read.

4,546,445

SYSTOLIC COMPUTATIONAL ARRAY

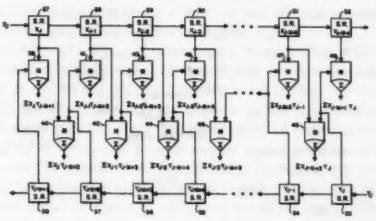
Paul R. Haugen, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 430,173
Int. Cl.[4] G06F *15/34*
U.S. Cl. 364—728 **4 Claims**

1. A systolic computational array comprising:

a plurality of multiply-accumulate devices, each of said multiply-accumulate devices having a first input means adapted to accept members of a first series of numerical data and a second input means adapted to accept members of a second series of numerical data, each of said multiply-accumulate devices being adapted to accumulate a sum of products of members of said first series of numerical data and members of said second series of numerical data;

a first shift register having a plurality of stages, each of said stages being adapted to retain a value representative of a member of said first series of numerical data and to provide said value to said first input means of at least one of said multiply-accumulate devices, selected ones of said first shift register stages being adapted to provide said values to said first input means of at least two of said multiply-accumulate devices;



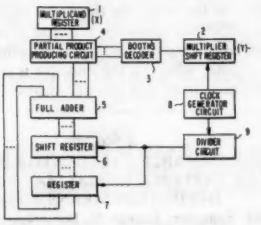
a second shift register having a plurality of stages, each of said stages being adapted to retain a value representative of a member of said second series of numerical data and to provide said value to said second input means of at least one of said multiply-accumulate devices and selected ones of said stages of said second shift register are adapted to provide said values to at least two of said second input means of said multiply-accumulate devices.

4,546,446

DIGITAL PROCESSING CIRCUIT HAVING A MULTIPLICATION FUNCTION

Toshiaki Machida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Japan

Filed Feb. 25, 1982, Ser. No. 352,398
Claims priority, application Japan, Feb. 25, 1981, 56-26499
Int. Cl.[4] G06F *7/54*
U.S. Cl. 364—759 **18 Claims**



1. A digital processing circuit for multiplying a multiplicand and a multiplier to produce a multiplication result, comprising:

first means for storing said multiplicand therein;

second means for storing said multiplier therein;

third means coupled to said second means for decoding the multiplier read out of said second means according to Booth's algorithm to thereby produce coefficients;

fourth means coupled to said third means and said first means for producing partial products by multiplying the multiplicand by said coefficients;

fifth means for receiving first and second inputs and for executing addition of said first and second inputs, said first input comprising said partial products;

sixth means for receiving an addition result from said fifth means and feeding back this result as said second input of said fifth means; and

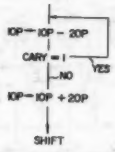
seventh means for outputting said addition result as a multiplication result.

4,546,447

DIVISION APPARATUS

Hideo Sawada, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,149
Claims priority, application Japan, Feb. 3, 1982, 57-14967
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—767 **3 Claims**



1. An apparatus for division, comprising: a first register for storing a dividend or an intermediate remainder; a second register for storing an integral multiple of a divisor; a third register for storing a carry obtained as part of the result of an arithmetic operation; complement means connected to said second register for producing the complement of the integral multiple of the divisor; a selection circuit connected to said second register and to said complement means for selecting the complement of the integral multiple of the divisor when the carry produced during the preceding arithmetic operation is 1 (one) and for selecting the integral multiple of the divisor when said carry produced during the preceding operation is 0 (zero) according to the contents of said third register; an arithmetic unit for performing addition on the basis of the output of said selection circuit applied to one input and the content of said first register applied to another input with the carry resulted from the preceding operation being utilized as an initial carry; counter means for counting a number which corresponds to said integral multiple of said divisor; means for controlling operation of said counter means and said arithmetic unit in dependence on the value by the carry produced during the preceding arithmetic operation is stored in said third register; and means for placing the result of the arithmetic operation in said first register whereby the quotient is determined on the basis of the content of said counter means.

4,546,448

PROGRAMMABLE CALCULATOR INCLUDING PROGRAM VARIABLE INITIALIZATION MEANS AND DEFINITION MEANS ARRAY

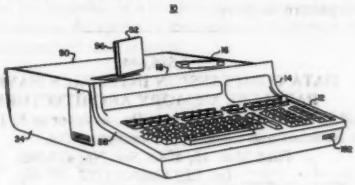
Richard M. Spangler; Eugene V. Burmeister; Frank E. Cada; Chris J. Christopher; Wayne F. Covington; Myles A. Judd; Freddie W. Wenninger; Robert E. Watson, and Kent W. Simcoe, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 200,281, Oct. 24, 1980, Pat. No. 4,366,553, which is a continuation of Ser. No. 99,101, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 969,754, Dec. 15, 1978, abandoned, which is a continuation of Ser. No. 758,961, Jan. 13, 1977, abandoned, which is a division of Ser. No. 469,727, May 30, 1974, Pat. No. 4,012,725, which is a continuation of Ser. No. 269,899, Jul. 7, 1972, abandoned. This application Sep. 22, 1982, Ser. No. 421,591
Int. Cl.[4] G06F *3/02, 9/06*
U.S. Cl. 364—900 **3 Claims**

1. Computing apparatus comprising:

keyboard input means for enabling a user to enter lines of alphameric characters, including program variables, into said computing apparatus, said keyboard input means including initialization key means;

memory means, coupled to said keyboard input means, for storing a program of lines of alphameric characters, including said program variables, entered into said computing apparatus and including means for storing a value associated with each said stored program variable;



logic means, coupled to said keyboard input means and memory means, for setting all of the program variables of the program stored in said memory means to said predetermined initial values in response to actuation of said initialization key means; and

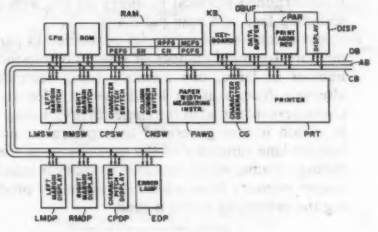
processing means, coupled to said keyboard input means and said memory means, for executing the program stored in said memory means.

4,546,449

OUTPUT DEVICE CAPABLE OF AUTOMATICALLY DETERMINING AN OUTPUT FORMAT

Katsumi Masaki, Sagamihara, and Toshifumi Tago, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 305,022, Sep. 23, 1981, abandoned. This application Aug. 10, 1984, Ser. No. 639,616
Claims priority, application Japan, Sep. 29, 1980, 55-135573
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—900 **28 Claims**



1. An output device for automatically producing a balanced output format, comprising:

means for determining a character pitch and margin values based on the width of a recording medium and the number of characters per line to be recorded on the recording medium;

check means for checking whether recording can be effected on the recording medium in accordance with the character pitch and margin values determined by said determining means; and

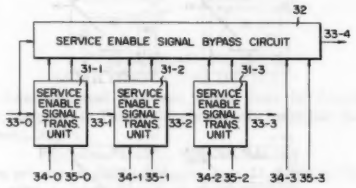
recording control means for recording characters on the recording medium in accordance with the output of said determining means.

4,546,450

PRIORITY DETERMINATION CIRCUIT

Akira Kanuma, Stanford, Calif., assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 237,250, Feb. 23, 1981,. This application Sep. 20, 1984, Ser. No. 657,457
Claims priority, application Japan, Feb. 26, 1980, 55-22920
Int. Cl.[4] G06F *9/46, 3/04*
U.S. Cl. 364—900 **5 Claims**



1. A circuit for determining priorities among a plurality of service requesting units having different service priority levels and being connected to a data processing unit, each of said service requesting units indicating its desire for access to said data processing unit by using a different service request flag, said circuit comprising:

at least one service enable unit coupled to said plurality of service requesting units, each service enable unit having an input terminal coupled to a service enable input signal and an output terminal producing a service enable output signal,

said service enable input signal indicating whether there is any outstanding request for access to said data processing unit which has a higher service priority level than that of any of said plurality of service requesting units coupled to said service enable unit, and

said service enable output signal indicating whether any of said service requesting units coupled to said service enable unit desires access to said data processing unit or whether said service enable input signal is indicating an outstanding request for access to said data processing unit which has a higher service priority level than that of any said service requesting units,

each said service enable unit including

(a) a service enable bypassing circuit including a plurality of signal bypassing AND gates each corresponding to a different service priority level, and an OR gate having inputs connected to the output of each of said signal bypassing AND gates and having an output connected to said service enable unit output terminal, the signal bypassing AND gate corresponding to the highest service priority level having an input coupled to said service enable unit input terminal,

(b) a plurality of serially-connected service enable signal transmission units each corresponding to a different service priority level and each of said service enable transmission units including first and second NAND gates with two input terminals and an output, the output of the first NAND gate in each of said signal transmission units being coupled to a first input of the second NAND gate in that signal transmission unit and the output of the second NAND gate of each of said transmission units, except for said transmission unit corresponding to the lowest service priority level, being connected to a first input terminal of the first NAND gate in the transmission unit having the next lowest service priority level, the first NAND gate of the service enable signal transmission unit corresponding to the highest service priority level having a first input coupled to said service enable unit input terminal,

(c) a plurality of service request flip-flops each corresponding to a different signal bypassing AND gate and to the service priority level of that signal bypassing AND gate, each of said service request flip-flops having a set terminal coupled to a different one of said service request units to receive from that unit a service request flag and each of said service request flip-flops also having first and second complementary output terminals,

said first output terminal of each service request flip-flop being connected to an input of the corresponding signal bypassing AND gate, and, except for said service request flip-flop corresponding to the lowest signal priority level, also being connected to a second input terminal of the first NAND gate in a different one of said service enable signal transmission units,

said second output terminal of each of said service request flip-flops providing a service request signal,

(d) a plurality of service request signal transmitting AND gates each corresponding to a different service request flip-flop and to the service priority level of that service request flip-flop, said service request signal transmitting AND gates each having a first input coupled either to the output of the adjacent service enable signal transmission unit or to the output of an adjacent service enable bypassing circuit, a second input terminal coupled to the service request signal of the corresponding service request flip-flop, and an output terminal,

(e) a plurality of service execution flip-flops each corresponding to a different service request signal transmitting AND gate and to the service priority level of that transmitting AND gate, each said service execution flip-flops having a set terminal connected to the output terminal of said corresponding service request signal transmitting AND gate and an output terminal providing a service execution signal, and

(f) a plurality of priority assignment flip-flops each corresponding to a different service execution flip-flop and to the service priority level of that service execution flip-flop,

each of said priority assignment flip-flops having a set terminal coupled to the service execution signal from the corresponding service execution flip-flop and each of said priority assignment flip-flops having third and fourth complementary output terminals,

said third output terminal being connected to a second input terminal of the second NAND gate in a different service enable signal transmission unit, and said fourth output terminal providing a priority signal, the priority signal of each of said priority assignment flip-flops, except the priority assignment flip-flop having the lowest priority, being connected to said signal bypassing AND gate having the next lower priority level.

4,546,451

RASTER GRAPHICS DISPLAY REFRESH MEMORY ARCHITECTURE OFFERING RAPID ACCESS SPEED

Robert A. Bruce, Beaverton, Oreg., assignor to Metheus Corporation, Hillsboro, Oreg.

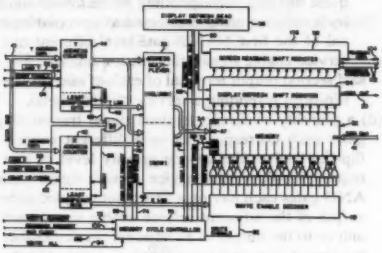
Filed Feb. 12, 1982, Ser. No. 348,517
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—900 **23 Claims**

1. A memory for use with a graphics display system having a display with two or more dimensions, said memory comprising:

(a) storage means for storing data representative of an image to be displayed, said storage means having a plurality of data storage locations corresponding to respective points of said display, each said data storage location having first and second storage addresses representing row and column addresses within said storage means, said storage means requiring that both said storage addresses be provided thereto sequentially to access an arbitrary storage location therein but permitting access to storage locations which share a common first storage address more rapidly by maintaining said first storage address continuously while said second storage address is provided anew than

by providing both said first and said second storage addresses anew to access a data storage location;

(b) first address means for providing to said storage means and continuously maintaining a first storage address for sequential access to a memory cell which comprises a plurality of said data storage locations which share a



common first storage address, said common first storage address providing access to a single row within said storage means; and

(c) second address means for mapping said data storage locations within said memory cell to correspond to points distributed in two or more dimensions of said display.

4,546,452

MAGNETIC BUBBLE DEVICE

Ryo Suzuki, Kodaira; Teruaki Takeuchi, Kokubunji; Naoki Kodama; Masatoshi Takeshita, both of Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,138

Claims priority, application Japan, Oct. 22, 1982, 57-184551

Int. Cl.⁴ G11C *19/08*

U.S. Cl. 365—36 **3 Claims**

1. A magnetic bubble device comprising a magnetic film capable of holding magnetic bubbles therein, at least one first elongate propagation path of a cyclic shape defined by selective ion implantation of said magnetic film, said cyclic shape having a period equal to a length λ, at least one second elongate propagation path each including a series of soft magnetic material elements formed on one surface of said magnetic film, and at least one junction element of a soft magnetic material formed between said first and second elongate propagation paths on the surface of said magnetic film for interconnecting them, said first elongate propagation path, said junction element and said second elongate propagation path being arranged substantially in line with one another, wherein that portion of said junction element which is coupled to said first elongate propagation path has a length measured in the direction perpendicular to the general direction of bubble propagation in said first propagation path not less than about 2.5 λ.

4,546,453

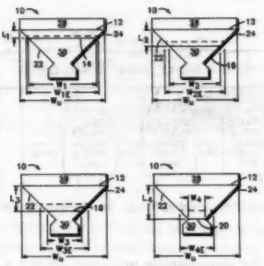
FOUR-STATE ROM CELL WITH INCREASED DIFFERENTIAL BETWEEN STATES

Glenn E. Noufer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 22, 1982, Ser. No. 391,031

Int. Cl.⁴ G11C *11/40, 13/00*

U.S. Cl. 365—104 **3 Claims**



1. A read only memory cell comprising a tansistor having a first current electrode, a second current electrode, and a control electrode of a predetermined width and length, wherein the cell is capable of being programmed into more than two states as determined by the width and length of the control electrode, the control electrode having a potential area between the first and second current electrodes, the potential control electrode area characterized as allowing variation of both width and length with a single program mask, and the control electrode characterized as having a length selected from a group of at least 3 possible lengths.

4,546,454

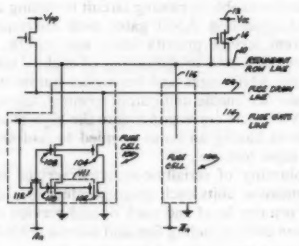
NON-VOLATILE MEMORY CELL FUSE ELEMENT

Anil Gupta, Sunnyvale, and George Perlegos, Fremont, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Filed Nov. 5, 1982, Ser. No. 439,602

Int. Cl.⁴ G11C *11/40*

U.S. Cl. 365—200 **13 Claims**



1. A semiconductor circuit for enabling a redundant word line in a semiconductor memory array, said circuit including:

non-volatile memory means capable of assuming a first unprogrammed state and a second programmed state;

addressing means responsive to addressing signals and coupled to said non-volatile memory means for selecting said non-volatile memory means for programming;

programming means adapted to receive programming signals for selectively causing said non-volatile memory means to change from said first to said second state in response to said programming and addressing signals;

semiconductor switching means connected between said redundant word line and said non-volatile memory means and responsive to said addressing signals for determining

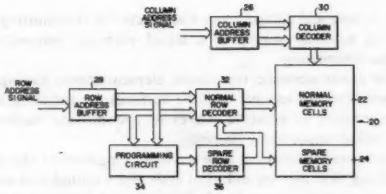
whether said non-volatile memory means is in said first or said second state and further for disabling said redundant word line in response to said first state and for enabling said redundant word line in response to said second state.

4,546,455

SEMICONDUCTOR DEVICE

Hiroshi Iwahashi, and Kiyofumi Ochii, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 3, 1982, Ser. No. 446,669
Claims priority, application Japan, Dec. 17, 1981, 56-204245; Dec. 17, 1981, 56-204246; Apr. 12, 1982, 57-60534
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—200 **21 Claims**



21. A semiconductor memory device responsive to an address signal and an inverted address signal which comprises:

normal memory cells;

spare memory cells;

normal decoder means coupled to said normal memory cells for selecting one of said normal memory cells according to said address signal;

spare decoder means coupled to said spare memory cells and said normal decoder means for selecting one of said spare memory cells and for inhibiting said normal decoder means; and

programming means coupled to said spare decoder means for programming the selection of said spare decoder means, said programming means including

a first power supply terminal,

an output terminal,

a plurality of first circuits each comprising a first fuse connected to a MOSFET having a first channel and a gate receiving at least a portion of said address signal,

a plurality of second circuits each comprising a second fuse connected to a MOSFET having said first channel and a gate receiving at least a portion of said inverter address signal, said plurality of first and second circuits being connected in parallel between said first power supply terminal and said output terminal,

a plurality of third circuits each comprising a third fuse connected to a MOSFET having a second channel and a gate receiving at least a portion of said address signal, and

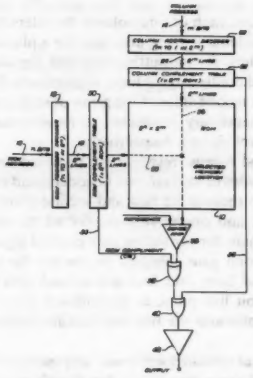
a plurality of fourth circuits each comprising a fourth fuse connected to a MOSFET having said second channel and a gate receiving at least a portion of said inverted address signal, each said third circuit being connected in parallel and in parallel with each said fourth circuit, one of said first and third fuses and one of said second and fourth fuses being blown in accordance with a signal representing a defective normal memory cell.

4,546,456

READ-ONLY MEMORY CONSTRUCTION AND RELATED METHOD

James L. Buie, Panorama City, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jun. 8, 1983, Ser. No. 502,071
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—227 **8 Claims**



1. A monolithic read-only memory circuit in which the speed-power product is substantially reduced, said circuit comprising:

an array of binary storage elements, the contents of which have been coded in such a manner that no more than a predetermined proportion of the elements are in a selected memory state;

subsidiary storage means, the contents of which are indicative of the manner in which the array of binary storage elements has been coded;

memory addressing means for selectively retrieving data from the coded contents of the array of binary storage elements; and

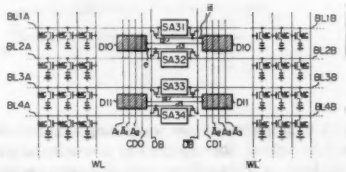
decoding means, for combining the retrieved coded data with the contents of the subsidiary memory means, to obtain decoded data.

4,546,457

SEMICONDUCTOR MEMORY DEVICE

Shigeki Nozaki, Kawasaki, and Yoshihiro Takemae, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 5, 1982, Ser. No. 439,591
Claims priority, application Japan, Nov. 5, 1981, 56-177478
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—230 **9 Claims**



1. A semiconductor memory device formed on a semiconductor substrate, operatively connected to receive first and second control signals, comprising:

a plurality of bit line pairs;

sense amplifiers arrayed on the semiconductor substrate, the array of said sense amplifiers having first and second sides,

said sense amplifiers, respectively, operatively connected to said bit line pairs;

first and second data buses respectively disposed on said first and second sides of the array of said sense amplifiers;

first and second gate elements respectively disposed on said first and second sides of the array of said sense amplifiers and connected between a corresponding bit line of one of said bit line pairs and one of said first and second data buses;

column decoders, each of said column decoders having first and second sides and being provided for a plurality of said sense amplifiers, for outputting decoded signals;

first and second control signal lines, respectively disposed on said first and second sides of the array of said senser amplifiers, and operatively connected to receive the first and second control signals, respectively;

first and second means, respectively disposed on said first and second sides of said column decoders, and operatively connected to receive the first and second control signals, respectively, and operatively connected to receive said decoded signals, for providing gate control signals to said first and second gate elements to control the transfer of signals to and from said first and second data buses and one of said bit line pairs, in dependence upon both said decoded signals and the first and second control signals; and

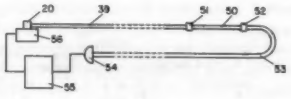
first and second conducting lines, disposed between the array of said sense amplifiers, for transferring said gate control signals between said first and second sides of the array of said sense amplifiers, each of said first conducting lines being connected between corresponding ones of said first gate elements and corresponding ones of said second means, each of said second conducting lines being connected between corresponding ones of said second gate elements and corresponding ones of said first means.

4,546,458

FREQUENCY MODULATED LASER DIODE

Paolo G. Cielo, 8300 rue Sherbrooke East, Montreal, Quebec, Canada H1L 6K9, and Garfield W. McMahon, 23 Ernest Ave., Dartmouth, N.S., Canada (B3A 2H6)

Filed May 17, 1982, Ser. No. 378,678
Claims priority, application Canada, May 27, 1981, 378436
Int. Cl.⁴ G01V *1/38*; H01S *3/00*
U.S. Cl. 367—149 **5 Claims**



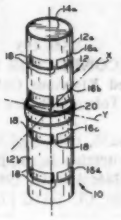
1. A hydrophone system comprising a diode laser source, a length of optical fiber adapted to transmit the output of the diode laser, a Fabry-Perot optical cavity sensing acoustic pressure fluctuations, a second optical fiber transmitting light from the sensor to a detector and a data-processing circuit that generates a signal representing said acoustical pressure fluctuations, wherein the output of the diode laser source is modulated by a dimensionally variable transducer mechanically coupled thereto, in response to an input from said data processing circuit.

4,546,459

METHOD AND APPARATUS FOR A PHASED ARRAY TRANSDUCER

John C. Congdon, Fort Wayne, Ind., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Dec. 2, 1982, Ser. No. 446,330
Int. Cl.⁴ H04R *17/00*
U.S. Cl. 367—155 **62 Claims**



1. A cylindrical passed array transducer for transmitting or receiving acoustic waves in a liquid external transmission medium, comprising:

a first electroacoustic transducer element means having at least first and second vibratile surfaces for radiating and responding to acoustic waves in transmission mediums coupled respectively thereto;

an elongated cylindrical tube having a longitudinal axis and having first and second axial ends and a cylindrical wall;

acoustic coupling means including at least a first pair of first and second port means being formed in said wall, each of said first and second port means for providing one or more openings in a substantially arcuate configuration on a periphery of said tube wall;

said tube for being filled internally with an acoustic transmission internal medium for providing an interior acoustic transmission path between said second vibratile surface and each of said first and second port means; said first and second port means each providing acoustic coupling between the liquid external transmission medium and the transmission internal medium;

said tube being of a material having a different acoustic characteristic impedance to acoustic waves than the liquid transmission external medium to provide an acoustic transmission path boundary for acoustic waves traveling interiorly of said tube between said transducer element means and said port means; said openings in said port means having an acoustic characteristic impedance so that there is provided substantially unattenuated transmission of acoustic waves through said openings;

first means for supporting said transducer element means relative said cylindrical tube at a position axially between and axially spaced from each of said first and second port means, and so that said first vibratile surface of said transducer element means is acoustically coupled with the liquid external medium and said second vibratile surface is acoustically coupled to said internal medium; said transmission paths being characterized in that within a frequency band of transducer operation, the effective acoustic length of said paths provides a reinforcing combination of acoustic radiation from said first vibratile surface and said port means in the liquid transmission external medium, said radiation having a direction broadside said longitudinal axis whereby maximum radiation of acoustic waves in the transmission external medium or maximum response to acoustic waves in the liquid transmission external medium occurs in said direction.

4,546,460

VIDEODISC AUTOFOCUS DEVICE

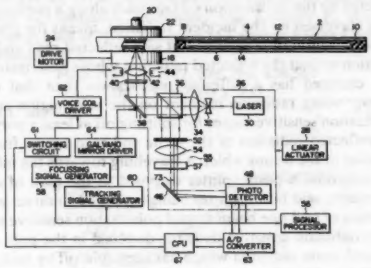
Hideo Ando, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

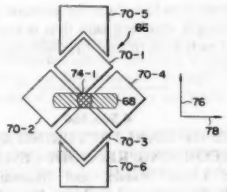
Filed Sep. 30, 1982, Ser. No. 430,387

Claims priority, application Japan, Oct. 22, 1981, 56-168967

Int. Cl.⁴ G11B *7/12*

U.S. Cl. 369—45 **16 Claims**





1. A system for focusing a light beam on a light-reflecting surface, comprising:

means for generating a light beam;

an objective lens for converging said light beam and projecting the converged beam to the light-reflecting surface;

means for transferring a light beam reflected from the light-reflecting surface; and

a photodetector having a first section including a photosensitive region and a second section including two photosensitive regions, said first section receiving a light beam from the transferring means when the objective lens is positioned at a distance shorter than a first predetermined distance from the light reflecting-surface or longer than a second predetermined distance from the light-reflecting surface, and said second section receiving a light beam from the transferring means when the objective lens is positioned at a distance longer than the first predetermined distance and shorter than the second predetermined distance.

4,546,461

METHOD FOR RECORDING INFORMATION ON A RECORDING DISC

Teruhiko Isobe, Tokorozawa, Japan, assignor to Pioneer Video Corporation, Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,657

Claims priority, application Japan, Dec. 7, 1981, 56-196633

Int. Cl.⁴ G11B *7/00, 19/00*

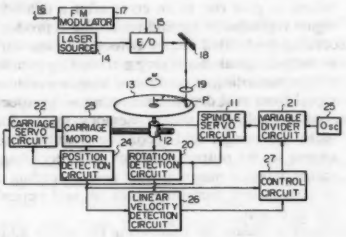
U.S. Cl. 369—50 **12 Claims**

1. A method for recording on a recording disc an information signal having a synchronizing signal, said method comprising:

forming a first type portion of recording tracks within a circular zone of the recording disc in which the information signal is recorded on the recording disc while the disc is rotated at a constant angular velocity of rotation so that corresponding positions of the recording tracks in which the synchronizing signal is recorded are aligned in a radial direction of the recording disc;

forming a second type portion of recording tracks within another circular zone of the recording disc in which the information signal is recorded on the recording disc under a condition that the angular velocity of the rotation of the disc is varying;

alternately effecting said first and second recording tracks



across a plurality of circular zones on the recording disc; and

determining values for said constant angular velocity of rotation for said step of forming a first type portion of recording tracks in such a manner that the constant angular velocity of rotation for a circular zone located radially outwardly of a first circular zone in which said first type portion of recording tracks are formed is smaller than the constant angular velocity of rotation for said first circular zone.

4,546,462

OPTICAL DATA RECORDING AND REPRODUCING APPARATUS

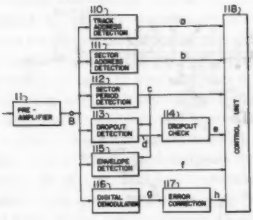
Kenji Koishi, Hyogo; Tomio Yoshida, Katano; Isao Satoh, Neyagawa, and Shunji Ohara, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 1, 1982, Ser. No. 446,007

Claims priority, application Japan, Dec. 4, 1981, 56-196048; Jul. 22, 1982, 57-128395; Oct. 8, 1982, 57-177949

Int. Cl.⁴ G11B *15/02, 27/00*

U.S. Cl. 369—53 **11 Claims**



1. An optical data recording and reproducing apparatus for recording digital data in a recording track on an optical recording disc having an address signal region, a sector address region for addressing sectors of said recording track and a data recording region, and for reproducing the digital data from said optical recording disc, comprising:

a light source,

light illuminating means for condensing an output light beam from said light source to produce a condensed output light beam having a very small diameter and for illuminating

said optical recording disc with said condensed output light beam,

recording-reproducing means for recording and reproducing said digital data by a recording light beam and a reproducing light beam from said light illuminating means, respectively,

dropout detecting and inspecting means for scanning said data recording region with said reproducing light beam to detect a presence of a dropout therein, inspecting a condition of a detected dropout, and producing an output signal upon determining a presence of a dropout which is determined to give rise to an error after a demodulation of a signal reproduced by said recording-reproducing means,

recording-prohibited sector detector means for producing an output signal identifying a recording-prohibited sector where recording is prohibited responsive to said output signal from said dropout detecting and inspecting means,

recording-prohibited sector memory means for storing a sector address of said recording-prohibited sector in response to the output signal of said recording-prohibited sector detector means at least until recording of said digital data in said recording track on said optical recording disc is begun,

comparator means for comparing the sector address of said recording-prohibited sector stored in said recording-prohibited sector memory means with a sector address read constantly from said optical recording disc, and

recording output prohibiting means for prohibiting an output of the recording light beam from said light illuminating means in response to a coincidence output signal from said comparator means and holding said digital data to be recorded until the next sector is encountered on said optical recording disc.

4,546,463

APPARATUS FOR RECORDING AND READING INFORMATION TRACKS ON AN OPTICAL RECORD CARRIER WITH A BEAM OF RADIATION

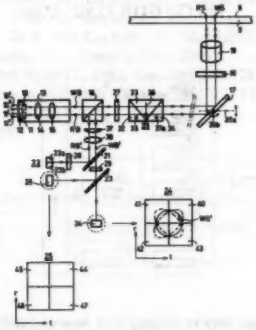
Willem G. Opheij, and Gerard E. van Rosmalen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,281

Claims priority, application Netherlands, Apr. 21, 1981, 8101932

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—110 **17 Claims**



1. An apparatus for recording and reading information tracks on a reflective information surface of a record carrier, said apparatus comprising a first semiconductor diode laser which emits a write beam of radiation of a first wavelength for producing detectable changes in the information surface so as to record information thereon, a second semiconductor diode laser which emits a read beam of radiation of a second wavelength which is different from said first wavelength for reading information recorded on the information surface, said first and second lasers being arranged such that said beams emitted thereby are substantially parallel, an objective system, said beams being directed through said objective system so that said objective system forms on the information surface a write spot and a read spot which is spaced from said write spot by a predetermined distance in the track direction and at least a portion of the radiation of each of said read and write beams is reflected by the information surface back along a portion of the paths traversed by the incident radiation, means for changing the polarization of at least one of said reflected read and write radiation so that the reflected radiation whose polarization has been changed has a different polarization than that of the corresponding radiation incident on the information surface, polarization sensitive means for splitting off at least a portion of said reflected radiation of the write and read beams from the radiation of the beams which is travelling towards the information structure, a beam splitter disposed in the path of one of said beams, said beam splitter being arranged to direct at least a portion of said one beam to said polarization sensitive means, a first radiation sensitive detector disposed in the path of the reflected write radiation which has been split off by said polarization sensitive means, a second radiation sensitive detector disposed in the path of the reflected read radiation which has been split off by said polarization sensitive means, and a wavelength selective filter disposed in front of each of said first and second detectors so as to reduce the amount of radiation of said second wavelength reaching said first detector and to reduce the amount of radiation of said first wavelength reaching said second detector.

4,546,464

METHOD OF MANUFACTURING AN OPTICAL RECORDING/REPRODUCING DISC

Takao Inoue; Yukio Maeda, and Masami Uchida, all of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

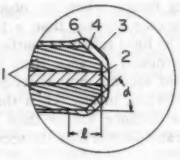
PCT No. PCT/JP83/00029, § 371 Date Oct. 4, 1983, § 102(e) Date Oct. 4, 1983, PCT Pub. No. WO83/02845, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 3, 1983, Ser. No. 548,891

Claims priority, application Japan, Feb. 5, 1982, 57-17807; Feb. 10, 1982, 57-20020

Int. Cl.⁴ G11B *19/02;* B05D *1/38*

U.S. Cl. 369—280 **4 Claims**



1. A method of manufacturing an optical recording/reproducing disc, said method comprising:

fixing plastic plates to opposite sides of a recording layer capable of permitting optical recording and reproducing of signals;

providing each said plate with an outer peripheral conical surface chamfered radially inwardly and axially away from said recording layer at an angle of 5° to 60° to the plane of said disc;

applying a solution of plastic material over opposite outer surfaces of said plates, said chamfered peripheral surfaces thereof, and the outer peripheral surface of said recording layer by a spin coating operation involving rotating said disc about the axis thereof;

by said spin coating operation forming from said solution respective integral annular projections extending axially outwardly from respective sides of said disc at locations

adjacent radially inner portions of respective said chamfered surfaces; and

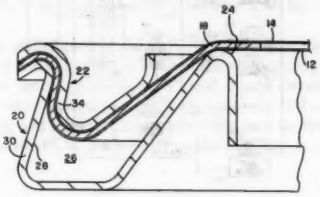
while rotating said disc about said axis causing said solution to set, thereby forming a protective coating having extending axially therefrom said annular projections.

4,546,465

OPTICAL DISC ASSEMBLY RETAINING RINGS

Kenneth G. Budinski, Rochester, and Kenneth F. Brandon, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1982, Ser. No. 438,565
Int. Cl.[4] G01D *15/32*
U.S. Cl. 369—287 **3 Claims**



1. An optical disc assembly comprising:

a flexible, disc-shaped support carrying a record layer, said support having an information storage region and an annular peripheral region radially outward of said storage region;

an annular retaining ring engaging said peripheral region of said support, said retaining ring comprising first and second ring members on opposed sides of said support;

an annular recess on said first ring member, said recess having a generally U-shaped cross-sectional shape (1) open at the side facing said support for receiving said second ring member and (2) having an annular undercut region;

an annular reference surface on said first ring member radially inwardly of said recess against which said support can be positioned to locate said record layer in a predetermined plane; and

a surface on said ring member, and being cooperative with said undercut region on said first ring member for providing a locking interfit therebetween with said second ring member at least partially within said annular undercut region on said first ring member, said annular peripheral region of said support being positioned against said annular reference surface and interleaved between the ring members within said recess in clamped circumferentially-symmetric tension.

4,546,466

OPTICAL ENCODER USING TIME DOMAIN AND WAVELENGTH MULTIPLEXING

Mario T. Lopiccolo, Southington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

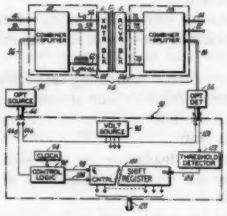
Filed Dec. 27, 1983, Ser. No. 566,005
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **4 Claims**

1. A light wavelength signal encoding apparatus, comprising: plural pulsed light source means, each providing primary light pulses, each having a different light source wavelength, each propagating on a corresponding one of a first plurality of input fiber optic lines, each of said sources pulsed at an associated selected real time pulse width interval;

first combiner-splitter means, responsive to each of said primary light pulses for combining said first plurality of input fiber optic lines at an input to a first fiber optic junction and for splitting said first fiber optic junction at an output thereof into a second plurality of transmitter fiber optic lines, each of said second plurality of transmitter fiber optic lines having all of said primary light pulses propagating thereon at reduced intensity in a wavelength multiplexed stream of secondary light pulses;

time delay means, having a second plurality of time delay fiber optic lines, each responsive at input ends thereof to a corresponding one of said second plurality of secondary light pulses on an associated transmitter fiber optic line, for delaying the propagation of each succeeding stream of secondary pulses by successively longer time intervals, the difference time delay between succeeding delayed streams being equal;

encoder means, including a transmitter portion a positionable mask portion having a spatial code with light transmissive and opaque regions in an array of channels imprinted thereon, and a receiver portion; said transmitter portion being responsive to said delayed streams of wavelength multiplexed secondary light pulses for presenting each of said second plurality of transmitter fiber optic lines in a spatial array on one side of said mask, said transmitter having each of said second plurality of transmitter fiber optic lines aligned with one channel of said array of channels; said mask portion transmitting and blocking selected ones of said delayed streams of wavelength multiplexed (secondary) light pulses according to said spatial code and said mask's position; said receiver portion having a second plurality of receiver fiber optic lines arrayed in alignment with said second plurality of transmitter fiber



optic lines, responsive to said transmitting and blocking of said selected ones of said delayed streams of wavelength multiplexed secondary light pulses for propagation thereof;

second combiner-splitter means, responsive to each of said delayed streams of wavelength multiplexed secondary pulses on said second plurality of receiver fiber optic lines, for combining said receiver fiber optic lines at output ends thereof at an input to a second fiber optic junction thereby combining said delayed streams in a time multiplexed manner and for splitting said second fiber optic junction at an output thereof into a first plurality of output fiber optic lines, each of said first plurality of output fiber optic lines having all of said time and wavelength multiplexed secondary light pulse streams propagating thereon;

plural filter means, each responsive to one of said streams of secondary light pulses on an associated one of said first plurality of output fiber optic lines, each filter transmitting only serial light pulses of an associated wavelength in said streams of secondary light pulses; and

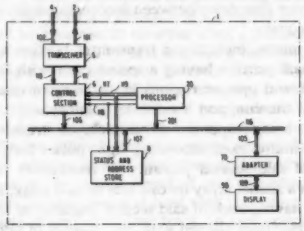
plural filtered light receiver means, each associated with an associated one of said filter means, each responsive to said light pulses transmitted by said associated filter, for providing in response to the presence and absence of a transmitted puse in each successive real time pulse width interval, output signal manifestations of the position of said positionable mask.

4,546,467

MONITOR FOR TRANSMISSION LINE

Sumio Yamamoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1983, Ser. No. 463,421
Claims priority, application Japan, Feb. 3, 1982, 57-16749
Int. Cl.⁴ H04J *1/16, 3/14*
U.S. Cl. 370—13 **5 Claims**



1. In a network system wherein at least one data communication unit and a transmission line monitoring device are interconnected by a common transmission line, the monitoring device comprising:

means for exchanging data with a specific data communication unit via the common transmission line;

means for receiving status information fed from said data communication unit;

storage means for storing the status information fed from said data communication unit and connected to the receiving means

comparator means for comparing said status information of the data communication unit stored in the storage means with new status information returned from the data communication unit;

display means for displaying the new status information in response to the result of comparison at the comparator means; and

status information writing means for writing the new status information in the storage means in place of the previously stored status information after said new status information has been compared with the stored status information in said comparator means.

4,546,468

SWITCHING NETWORK CONTROL CIRCUIT

Walter P. Christmas, Arvada, and Bruce W. Sanders, Boulder, both of Colo., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 13, 1982, Ser. No. 417,598
Int. Cl.⁴ H04Q *11/04*
U.S. Cl. 370—54 **10 Claims**

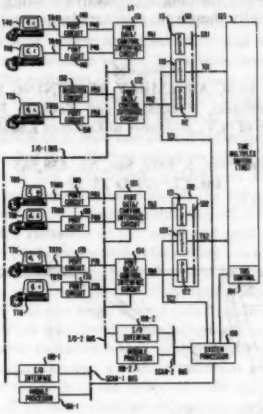
1. In a switching system which serves a plurality of communication circuits (T40–T78) each of which is connected by an associated one of a plurality of port circuits (140–178) to a switching network (101–103) of said switching system, which switching network (101–103) establishes communication connections among said port circuits (140–178) by controllably exchanging digital call signals among said port circuits (140–178), a method of controlling said switching network (101–103) comprising the steps of:

monitoring said port circuits (140–178) for service requests;

creating a plurality of functionally equivalent sets of response operations to satisfy said service requests;

selecting one of said sets of response operations;

converting said selected set of response operations into a network map of circuit interconnections; and



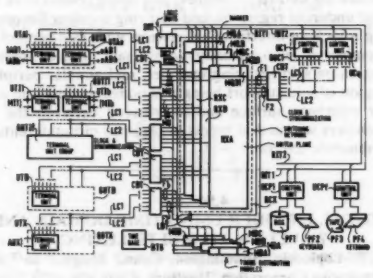
controlling said switching network (101–103) to establish said communication connections based on said network map.

4,546,469

SYSTEM FOR PROCESSING CHANNEL SIGNALLING IN A TIME-DIVISION DIGITAL EXCHANGE

Jean-Paul Favrel, Rueil Malmaison; Jean Ouss, Meudon, and Jean-Marc Pocheau, Ivry sur Seine, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 6, 1983, Ser. No. 558,728
Claims priority, application France, Dec. 6, 1982, 82 20407
Int. Cl.⁴ H04J *3/12*
U.S. Cl. 370—77 **9 Claims**



1. A system for processing channel signalling in a time division digital exchange for switching at least some telephone channels including channels switched on a demand basis and tie-line channels connected on a semi-permanent basis, the exchange including: microprocessor control units; a switching network; and microprocessor terminal units; said control units and said terminal units being connected to said switching network via two-way multiplex lines enabling said terminal units to be controlled by said control units and also enabling said terminal units to communicate with one another; said terminal units including digital circuit terminal units serving respective PCM junctions via respective digital circuits and said exchange including at least one mixer and separator means

coupled to said exchange for storing information defining tie line cross connections passing through the exchange;

the improvement wherein said system for processing signalling comprises means for serving communications channels both on a demand basis and on a tie line basis, said means being incorporated both in said digital circuit terminal units and in said mixer and separator means and comprising for each of said digital circuits:

a digital terminal to perform transcoding and frame realignment;

a signalling receiver circuit for receiving channel by channel signalling from said PCM junction connected to said digital circuit and for forwarding to said mixer and separator means at least the tie line signalling relating to channels in said PCM junction which are used on a tie line basis; and

a signalling and alignment circuit serving firstly to monitor in parallel the alignment of the multiframes coming from the PCM junction connected to said digital circuit and from the mixer and separator means receiving said tie line signalling, and secondly for transmitting said tie line signalling to the PCM junction served by said digital circuit.

4,546,470

COMMUNICATIONS SYSTEMS

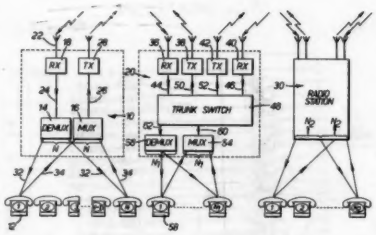
Michael Naylor, Reading, and Robert Latham, Camberley, both of England, assignors to Racal-SES Limited, Bracknell, England

Filed Dec. 1, 1983, Ser. No. 556,916

Claims priority, application United Kingdom, Dec. 8, 1982, 82 34992

Int. Cl.⁴ H04J *3/00, 1/10, 3/08;* **H04Q** *11/04*

U.S. Cl. 370—97 **5 Claims**



1. A device for use in an intermediate relay station of a digital, time division multiplexed (TDM) communications system, said device comprising switch means having a plurality of inputs and outputs carrying multi-channel TDM signals, each signal comprising a series of frames each of which contains at least one bit of a signal to be transmitted in each channel, a multiplexer connected to one of said inputs, a demultiplexer connected to one of said outputs, ports of the multiplexer and demultiplexer being for connection to a plurality of user terminals, said switch means including a traffic memory having an input, means connected to all of said inputs for receiving and storing in said traffic memory each frame of the input TDM signals, the input to said traffic memory being capable of operating at a rate greater than the expected total rate of arrival of bits at all the inputs so as to buffer clock variations in the inputs means for reading out selected bits from said traffic memory to each output to create output TDM signals such that each output channel corresponds to a single input channel, and programmable control means for determining the path of each channel through the device.

4,546,471

MULTIPLEXING DEVICE FOR GROUPING TWO FREQUENCY BANDS

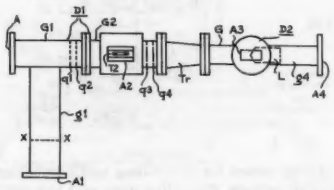
Nhu Bui-Hai, Paris, France, assignor to Thomson CSF, Paris, France

Filed Jun. 16, 1983, Ser. No. 504,826

Claims priority, application France, Jun. 25, 1982, 82 11208

Int. Cl.⁴ H01P *1/213*

U.S. Cl. 370—123 **3 Claims**



1. A multiplexing device for multiplexing two frequency bands B1, B2, in which the frequencies of B1 are lower than the frequencies of B2, said device comprising:

an input adapted to be coupled to an antenna which receives said frequency bands B1 and B2,

a first polarization duplexer connected to said input and including a common guide for passing bands B1 and B2, said common guide having two successive guide sections, each guide section having a single coupling hole in which is placed at least one resonator tuned to a frequency of band B2, the coupling holes of the two guide sections being rotated with respect to one another by 90° about the common guide and designated as first and second coupling holes, said first duplexer further including two rectangular guides, one leading to said first coupling hole and the other leading to said second coupling hole, each rectangular guide having two parallel short sides and two parallel long sides;

a second polarization duplexer relating to band B2 and connected to said first polarization duplexer; and

first and second filters, said first filter being placed between said first coupling hole and said second coupling hole and constituting a short-circuit for the waves of band B1 which have a first polarization, and said second filter being placed between said second coupling hole and said second duplexer and constituting a short-circuit for the waves of band B1 which have a second polarization orthogonal to the first polarization.

4,546,472

METHOD AND MEANS FOR TESTING INTEGRATED CIRCUITS

Andrew Volk, and Christopher McAfee, both of San Jose, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 27, 1983, Ser. No. 461,408

Int. Cl.⁴ G01R *31/28;* **G06F** *11/00*

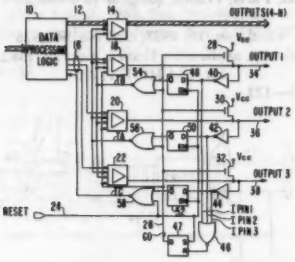
U.S. Cl. 371—15 **14 Claims**

1. In an integrated circuit having data processing logic thereon, said data processing logic having a plurality of logic outputs, said integrated circuit further having a plurality of integrated circuit inputs including a reset input, and a plurality of integrated circuit outputs, the improvement comprising:

test control logic means, connected to a number of said integrated circuit outputs on said integrated circuit, for generating a test signal state on test control logic outputs in response to test signals on said number of said integrated circuit outputs, said test signals being inputted on said number of said integrated circuit outputs from an external source; and,

decoding means connected to said logic outputs of said data processing logic, to said number of integrated circuit

outputs and to said test control logic outputs, for decoding said test signal state, said decoding means including con-



trolling means for controlling said number of integrated circuit outputs, depending upon said test signal state.

4,546,473

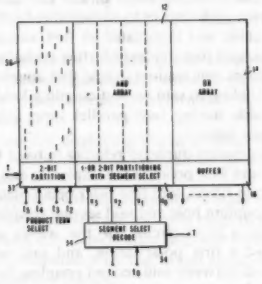
RANDOM PATTERN SELF TEST DESIGN

Edward B. Eichelberger, Hyde Park, and Eric Lindbloom, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1983, Ser. No. 492,288

Int. Cl.⁴ H03K *19/177*

U.S. Cl. 371—25 **7 Claims**



1. An array logic device of the type having first and second orthogonal sets of lines, means for applying input signals to the lines of the first set, circuit elements located at selected cross-over points of the array to establish a pattern of interconnections from the first set to the second set, means for translating signals on the second set of lines to device output signals, means for generating a first plurality of random test signals and means for applying said test signals to said first lines, and means for detecting a function of the signal on said second lines during a test, wherein an improvement for self-testing the logic device comprises,

means for supplying a second plurality of random signals, and means responsive to the second plurality of random signals for selectively enabling the lines of the first set in a plurality of segments during a test, and

a second array having third and fourth orthogonal sets of lines, said fourth set of lines being formed as extensions of the lines of the second set, circuit elements at intersections of the third and extension lines in a pattern to disable a plurality of said second lines according to signals on said third lines, means for supplying a third plurality of random signals, and means responsive to said third plurality of random signals for forming signals on said third lines to disable a plurality of said second lines during a test,

said second and third random signal means being arranged to cooperate with said first random signal means for stepping the device through a predetermined sequence of random test states, whereby after a predetermined number of steps the state of the device can be compared with the state of good device.

4,546,474

METHOD OF ERROR CORRECTION

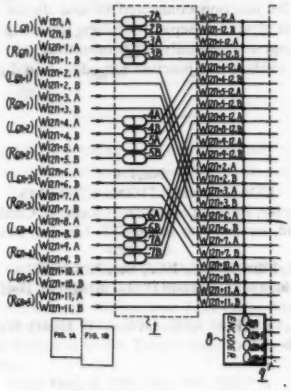
Yoichiro Sako, and Kentaro Odaka, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

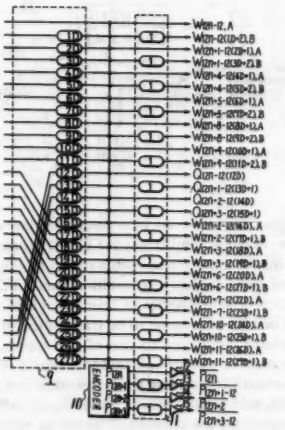
Continuation of Ser. No. 613,761, May 24, 1984, abandoned, which is a continuation of Ser. No. 275,328, Jun. 19, 1981, abandoned. This application Dec. 21, 1984, Ser. No. 684,161

Claims priority, application Japan, Jun. 20, 1980, 55-84424; Jun. 20, 1980, 55-84427; Jun. 20, 1980, 55-84428

Int. Cl.⁴ G06F *11/10*

U.S. Cl. 371—39 **14 Claims**





1. A method of decoding transmitted digital information signals to correct errors occurring therein as a result of transmission, wherein said information signals are received as blocks of interleaved digital data word signals and are applied to a first decoder as first error-correcting blocks comprised of a plurality of information word signals, a series of first check word signals associated with said plurality of information word signals, and a series of second check word signals associated with said plurality of information word signals, said informa-

tion word signals and said first check word signals being interleaved, comprising the steps of:

decoding the received digital data word signals in said first decoder and correcting up to a predetermined number of the decoded digital information word signals and first check word signals by generating error syndromes using said second check word signals, the corrected and decoded digital information word signals forming a block of interleaved word signals;

tagging a pointer code signal to each of said information word signals of the block of interleaved word signals to represent whether an uncorrected error remains in such words, and, whenever there are more than said predetermined number of erroneous word signals in such block, giving all word signals thereof a pointer code signal indicating error;

delaying the tagged interleaved word signals of each such block of tagged interleaved word signals in a deinterleaving stage by respective different amounts so as to deinterleave such tagged interleaved word signals into a different arranging order, thereby providing a second error-correcting block; and

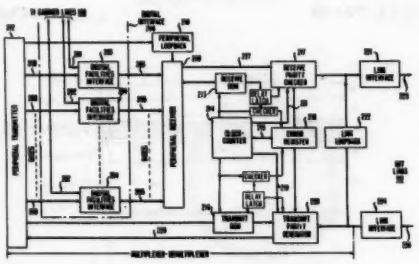
decoding the digital information word signals of each such second error-correcting block in a second decoder by generating error syndromes using said first check word signals and correcting up to another predetermined number of erroneous word signals in such second error correcting blocks where the location of any erroneous word signal as calculated from said error syndromes is coincident with at least one of the erroneous word signals as indicated by the associated pointer code signals.

4,546,475

PARITY CHECKING ARRANGEMENT

Charles H. Sharpless, Wayne, Ill., and Robert W. Van Slooten, Randolph, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 6, 1982, Ser. No. 447,008
Int. Cl.⁴ G06F *11/10*
U.S. Cl. 371—49 **15 Claims**



1. A transmission integrity arrangement for a two-way plural channel communication system comprising

means for interfacing with said channels,

first and second read-only memory (ROM) means for opposite transmission directions for storing a data word for each time slot in said system transmitted to and received from said interface means, said data word including a destination selection code for each channel, the sense of parity bits for the message traversing the channel, the parity of the subsequent ROM address value and the overall parity of the ROM data word;

counter means for controlling the read-out of the words of data from said first and second ROM means in sequence; and

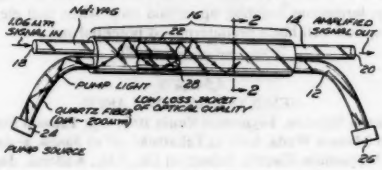
parity checking means for data received from said interface means and parity generator means for data transmitted to said interface means for producing localized indications of parity failure.

4,546,476

FIBER OPTIC AMPLIFIER

Herbert J. Shaw, and Marvin Chodorow, both of Stanford,, Calif., assignors to The Board of Trustees of The Leland Stanford Junior University, Stanford, Calif.

Filed Dec. 10, 1982, Ser. No. 448,707
Int. Cl.⁴ H01S *3/30*
U.S. Cl. 372—6 **30 Claims**



1. A fiber optic device for producing coherent light, comprising:

a first fiber having a first refractive index;

a second fiber, formed of material which will lase, having a second refractive index higher than said first refractive index;

means for introducing light into said first fiber for pumping said material of said second fiber, the wavelength of said light for pumping selected to cause a population inversion in said material which will lase; and

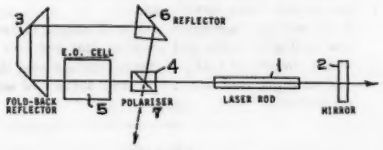
an intermediate transfer material for allowing the transfer of light from said first fiber to said second fiber while preventing transfer of light from said second fiber to said first fiber, said transfer material having an index of refraction which is less than said second fiber, but which is not less than said first fiber.

4,546,477

PULSE TRANSMISSION OR REFLECTION MODE LASER

James Richards, Adelaide, Australia, assignor to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU83/00043, § 371 Date Dec. 21, 1983, § 102(e) Date Dec. 21, 1983, PCT Pub. No. WO83/03926, PCT Pub. Date Nov. 10, 1983
PCT Filed Apr. 13, 1983, Ser. No. 573,914
Claims priority, application Australia, Apr. 23, 1982, PF3729
Int. Cl.⁴ H01S *3/11*
U.S. Cl. 372—12 **6 Claims**



1. A Q-switched laser comprising:

a laser rod;

a mirror in optical alignment with and disposed on one side of said laser rod and an optical loop including:

a polarizer in optical alignment with and disposed on another side of said laser rod opposite said mirror;

an electro-optical cell disposed to pass light from and to said laser rod transmitted through said polarizer;

fold-back reflector means for folding back light from and to said electro-optical cell; and

a reflector disposed to reflect light from said fold-back reflector means to said polarizer along a different axis than that of light passing between said polarizer and said electro-optical cell, and to reflect said light from said polarizer to said fold-back reflector means; said polarizer, said fold-back reflector means and said reflector being disposed to cause light to form said loop around said electro-optical cell such that light of a first polarization travels around said loop in a first direction and light of a second polarization travels around said loop in a second direction opposite said first direction; light of both said first and second polarizations building up in said loop when said electro-optical cell has a predetermined potential state.

4,546,478

SEMICONDUCTOR LASER

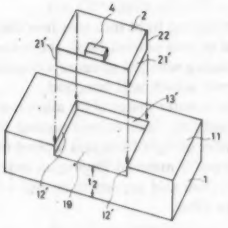
Hirokazu Shimizu, Toyonaka; Kunio Itoh, Uji; Takashi Sugino, and Masaru Wada, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

Continuation of Ser. No. 270,350, Jun. 4, 1981, abandoned. This application May 25, 1984, Ser. No. 614,390

Claims priority, application Japan, Jun. 17, 1980, 55-82640

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—36 **5 Claims**



1. A semiconductor laser comprising:

a semiconductor laser chip,

a sub-mount having an upper surface on which said semiconductor laser chip is bonded by means of a solder layer,

a main mount on which said sub-mount is boned by means of another solder layer,

wherein the improvement is that

said main mount is provided with a recess as engaging means to receive said sub-mount therein, said recess comprising flat side walls, a flat abutting wall and a flat bottom surface,

said sub-mount is provided with flat side walls, a flat abutting rear end face and a flat under surface opposite to said sub-mount upper surface, and

said sub-mount is bonded on said main mount in a manner so that said side walls, said abutting rear end face and said under surface of said sub-mount engage said side walls, said abutting wall and said bottom surface of said recess, respectively.

4,546,479

SEMICONDUCTOR LIGHT-EMITTING DEVICE WITH LAYERS HAVING DIFFERENT BAND GAPS

Hiroshi Ishikawa, Tokyo, and Mitsuhiro Yano, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1982, Ser. No. 435,741

Claims priority, application Japan, Oct. 27, 1981, 56-171801

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—45 **6 Claims**

5. A semiconductor light-emitting device, comprising:

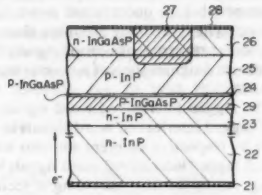
a first electrode;

a substrate of a first conductivity type formed on said first electrode;

a first clad layer of the first conductivity type formed on the substrate and having a first band gap;

a semiconductor buffer layer of a second conductivity type formed on said first clad layer and having a second band gap narrower than the first band gap of said first clad layer;

an active layer of the second conductivity type formed on the semiconductor buffer layer having a third band gap



narrower than the second band gap of said semiconductor buffer layer;

a second clad layer of the second conductivity type formed on said active layer;

a current restriction layer of the first conductivity type formed on said second clad layer;

a current path region of the second conductivity type formed in said current restriction layer; and

a second electrode formed on said current restriction layer and said current path region.

4,546,480

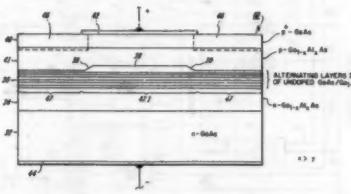
INJECTION LASERS WITH QUANTUM SIZE EFFECT TRANSPARENT WAVEGUIDING

Robert D. Burnham, Palo Alto; Donald R. Scifres, Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 19, 1983, Ser. No. 524,623

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—45 **11 Claims**



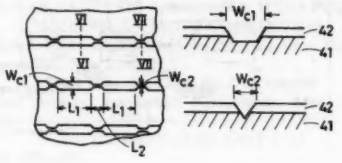
1. In an injection laser comprising a plurality of contiguous semiconductor layers deposited on a substrate, one of said layers being an active layer and having a lower bandgap and higher index of refraction relative to at least cladding layers immediately adjacent to said active layer, said active layer having an active region to permit radiative recombination and support radiation propagating under lasing conditions in a cavity established between transverse end facets of the laser, means incorporated into said laser to confine current to said active region, the extremities of said active region falling short of said end facets so that the regions of said active layer between said active region and said end facets function as a passive waveguide for the propagating radiation, said passive waveguide regions of said active layer being sufficiently thin in layer thickness to form a transparent waveguide having a quantum well effect so that radiative recombination will not occur in these regions.

4,546,481

WINDOW STRUCTURE SEMICONDUCTOR LASER

Saburo Yamamoto, Nara; Hiroshi Hayashi, Kyoto, and Seiki Yano, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1983, Ser. No. 476,844
Claims priority, application Japan, May 28, 1982, 57-91636; Jun. 23, 1982, 57-108706
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—48 7 Claims



1. In a window structure semiconductor laser configuration including a substrate, a current blocking layer, a cladding layer, and an active layer, said configuration comprising:

a medial stimulated region which includes a crescent active layer; and

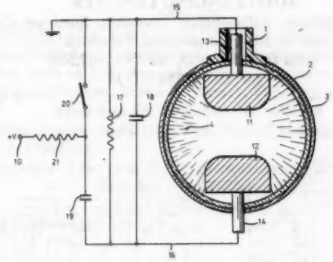
window regions formed laterally at both ends of said stimulated region, each of said window regions including a plane active layer, said stimulated region defining a waveguide width which is narrower than a waveguide width determined by each of said window regions.

4,546,482

SEALED CO_2 LASER

Adriano Bagaglia; Renato Marchetti, and Eugenio Penco, all of Rome, Italy, assignors to Selenia Industrie Eletroniche Associate, S.p.A., Rome, Italy

Filed Jun. 15, 1983, Ser. No. 504,133
Claims priority, application Italy, Jun. 15, 1982, 48641 A/82
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—86 5 Claims



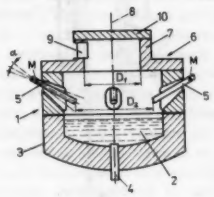
1. A laser comprising a sealed cylindrical housing of dielectric material forming a laser-resonant cavity, delimitized by a partially transmissive mirror and a fully reflective mirror a pair of confronting main electrodes extending axially within said housing, a CO_2-active gaseous medium in said housing capable of excitation by said electrodes to produce laser emissions, a trigger circuit connected across said main electrodes for periodically pulsing said main electrodes to produce a laser output by ionization of said medium and an ancillary external electrode covering substantially the entire outer surface of said housing in conductive contact with one of said main electrodes for generating a pre-ionizing corona discharge in said gaseous medium.

4,546,483

PLASMA MELTING FURNACE ARRANGEMENT

Walter Lugscheider, Linz; Alois Leutgöb, Steyr; Ernst Riegler, Enns; Ernst Zajicek, Ottensheim, and Othmar Pühringer, Linz, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 27, 1983, Ser. No. 536,243
Claims priority, application Austria, Oct. 5, 1982, 3673/82
Int. Cl.[4] H05B 7/00
U.S. Cl. 373—24 4 Claims



1. In a plasma melting furnace arrangement of the type including a refractorily lined furnace body defining a furnace interior and having a cylindrical side wall with an upper end and an inner surface, and a plurality of downwardly directed plasma burners guided through said side wall, said plasma burners having burner mouths projecting into said furnace interior beyond said inner surface, said furnace further including an attached refractorily lined cover affixed to said upper end, said cover closing said furnace interior, the improvement wherein said cover comprises a shoulder-like re-entering part projecting upwardly and defining a charging shaft, a central charging opening delimited by said part, and a removable lid to close said opening, and wherein said plasma burner mouths are arranged substantially along a circle of a certain diameter, said central charging opening being disposed above said circle and having a diameter that is smaller than the diameter of said circle.

4,546,484

DEVICE FOR THE CONTINUOUS MANUFACTURE OF ELONGATED BODIES STARTING FROM UNMOLTEN SOLID STARTING MATERIAL

Wilhelmus C. P. M. Meerman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,118
Claims priority, application Netherlands, Nov. 16, 1982, 8204438
Int. Cl.[4] C03B 5/02
U.S. Cl. 373—27 5 Claims

1. A device for continuous manufacture of elongated bodies comprising:

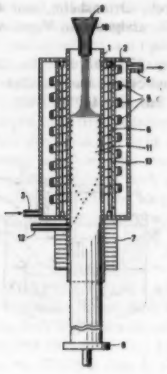
a vertically arranged tube for containing melted starting material,

a cooling jacket surrounding a heating zone of said tube,

a coil of metal tape around said heating zone within said cooling jacket, said coil generating a high-frequency electromagnetic field during operation,

a plurality of metal wires extending parallel to the axis of said tube, said wires being located between said coil and said tube,

a quartz tube located between said metal wires and said coil, and



means for flowing coolant through said cooling jacket around said coil and said metal wires.

4,546,485

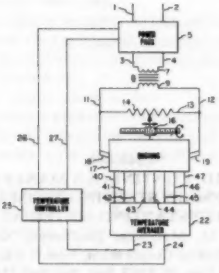
METHOD AND APPARATUS FOR PRODUCING UNIFORM STRANDS FROM A SPLIT FIBER GLASS BUSHING

David H. Griffiths, and Larry G. Wright, both of Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1983, Ser. No. 556,828

Int. Cl.⁴ C03B *5/02*

U.S. Cl. 373—28 **7 Claims**



1. In the operation of a fiber glass bushing from which several strands are being produced and wound as multiple packages on a single winding collection surface, and wherein the package weights vary beyond a desired value, the improvement comprising, sensing the temperature of the bushing at one or more locations on the bushing, producing signals in response to the sensed temperature, feeding those signals to a control circuit for a power transformer supplying power to the bushing, providing a variable impedance across power input to the bushing and in contact with an adjustable tap connected to the bushing and varying the current supply to each side of the bushing by movement of the tap on the variable impedance to equalize the weight of the packages being wound to thereby bring them to the desired value.

4,546,486

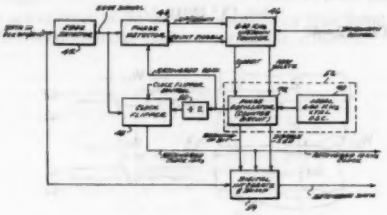
CLOCK RECOVERY ARRANGEMENT

Michael W. Evans, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Aug. 29, 1983, Ser. No. 527,471

Int. Cl.⁴ H03D *3/24*

U.S. Cl. 375—119 **21 Claims**



1. A clock recovery arrangement for recovering a clock signal at a first frequency, which clock signal is synchronized to a received data stream having a characteristic data bit frequency equal to said first frequency, comprising:

means for detecting edge transitions of said data stream and producing an edge signal indicative thereof;

means for generating a local second frequency clock signal, said second frequency being twice that of said first frequency, said second frequency clock signal not being phase synchronized with said received data stream;

means for phase locking said second frequency clock signal to said edge transitions to produce a phase locked second frequency clock;

means for dividing said phase locked second frequency clock by two to produce a clock signal at said first frequency that is phase locked to said edge signal and therefore phase locked to said received data stream; and

means for changing the polarity of said phase locked first frequency clock according to a predetermined function of said edge signals, thereby producing a received clock synchronized to said received data stream.

4,546,487

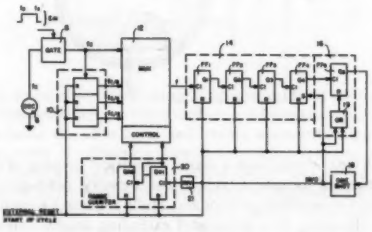
AUTO RANGING COUNTER

Paul N. Dackow, Hillsborough Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 30, 1983, Ser. No. 567,336

Int. Cl.⁴ H03K *21/34*

U.S. Cl. 377—51 **9 Claims**



1. The combination comprising:

first and second counters;

timing means for producing pulses whose frequency may be altered;

means for selectively applying said pulses to said first counter;

means responsive to the count in said second counter coupled to said timing means for decreasing the frequency of

the pulses produced by said timing means by a factor of 1/N each time the count in said second counter increases where N is a positive integer greater than 1; and

overflow sensing means coupled between said first and second counters responsive to an overflow signal at an output of said first counter for incrementing the count in said second counter and for presetting the count in said first counter to a new count which is equal to 1/N the count in the first counter prior to its overflow.

4,546,488

X-RAY ANALYSIS APPARATUS WITH PULSE AMPLITUDE SHIFT CORRECTION

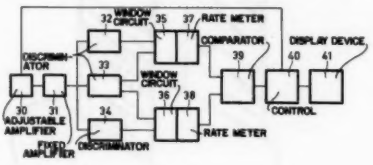
Meindert J. Kleefstra, Prairieview, Ill., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,548

Claims priority, application Netherlands, Mar. 31, 1982, 8201342

Int. Cl.⁴ G01N *23/20*; G01T *1/17*

U.S. Cl. 378—49 **4 Claims**



1. In an X-ray apparatus comprising an X-ray source, a sample receiving X-rays from said source, an analyzing crystal receiving X-rays from said sample, and a detector receiving X-rays from said analyzing crystal, the improvement comprising said detector applying signals to amplifying means including a preamplifier for amplifying signals from said detector, circuit means for controlling said amplifying means, and means for recording and displaying said signals,

wherein said circuit means includes a pulse amplitude shift correction circuit means for providing correction signals, said correction signals being a measure of and being in response to pulse amplitude shifts.

4,546,489

SINGLE TANK X-RAY DIAGNOSTIC GENERATOR

Hermann Kühnke, Muenchaurach, and Manfred Rattner, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

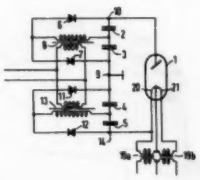
Filed Sep. 28, 1982, Ser. No. 425,278

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 8132991[U]

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ G03B *41/16*

U.S. Cl. 378—103 **1 Claim**



1. An X-ray diagnostic generator having a plurality of components comprising a double focus X-ray tube, two high voltage transformers for feeding said X-ray tube having respective vertical axes, two double circuits respectively connected to the secondaries of said high voltage transformers, each of said doubler circuits consisting of two high voltage rectifiers and two high voltage capacitors, and two filament supply transformers connected to said double focus X-ray tube having respective vertical axes, and a single oil-filled receptacle containing all of said components having a flat base plate, said receptacle having a radiation exit window centrally disposed therein aligned on one side of said X-ray tube through which X-rays from said X-ray tube are emitted, said two high voltage transformers being mounted on said base plate in said receptacle with their vertical axes in a first common vertical plane adjacent to said X-ray tube and in symmetrical relation with respect to said radiation exit window and in close proximity to opposite end walls of said receptacle, said rectifiers and said capacitors being disposed in said receptacle above and on opposite sides of said X-ray tube in symmetrical relation to said radiation exit window and being supported by said two high voltage transformers a distance above said base plate, and said two filament transformers being disposed on said base plate adjacent to one another in said receptacle at one end of said X-ray tube with their vertical axes in a second common vertical plane substantially perpendicular to said first common vertical plane, and a removable housing mating with said base plate for enclosing and defining said oil-filled receptacle in combination with said base plate.

4,546,490

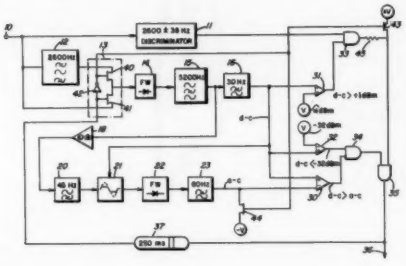
SINGLE FREQUENCY DETECTION CIRCUIT

James J. Miller-Thomson, Beaconsfield, and Gilles Dupuis, Brossard, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 22, 1984, Ser. No. 592,450

Int. Cl.⁴ H04R *29/00*

U.S. Cl. 381—56 **3 Claims**



1. A single frequency tone detection circuit for detecting the presence of a signalling tone having upper and lower magnitude limits, in the presence of other signals, comprising:

discriminator means for detecting the presence of signals having a frequency component substantially the same as the signalling tone;

a band-pass filter for passing said signalling tones;

a rectifier for rectifying signals from the output of the band-pass filter;

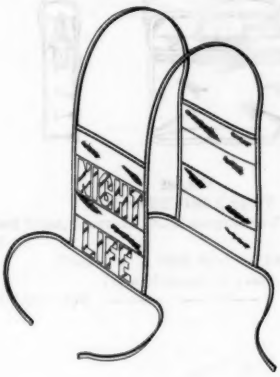
a low-pass filter responsive to the output of the rectifier for passing substantially all signals having frequency components below the fundamental frequency component of the rectified signalling tone;

first comparison means for indicating when the ratio of the d-c to a-c components of the signal at the output of the low-pass filter is greater than a predetermined amount;

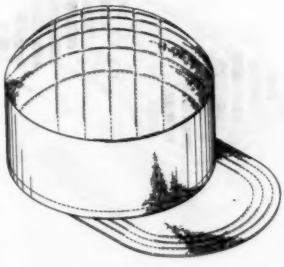
second comparison means for indicating when said d-c component is between said upper and lower magnitude limits; and

gating means responsive to the discriminator means and the first and second comparison means for indicating the presence of a valid signalling tone.

280,860
REFLECTIVE SAFETY VEST
Angela M. Monferrato, 1600 SE. 15th St., Fort Lauderdale, Fla. 33316
Filed Apr. 22, 1983, Ser. No. 487,818
Term of patent 14 years
U.S. Cl. D2—27



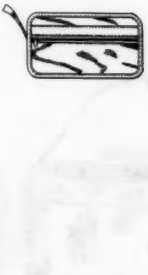
280,861
HAT
Dennis D. B. Giraud, 312 Carnarvon St. #4, New Westminster, B.C., Canada V3L 5H6, and Timothy J. W. Ivamy, 1015 Ironwork Passage, Vancouver, B.C., Canada V6H 3R4
Filed Sep. 6, 1983, Ser. No. 529,980
Term of patent 14 years
U.S. Cl. D2—244



280,862
POCKETED SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Oct. 25, 1982, Ser. No. 436,562
Term of patent 14 years
U.S. Cl. D2—310

280,863
BEEPER HOLSTER
Lonzie Leath, 3810 Kimball Ridge Dr., Dallas, Tex. 75233
Filed Apr. 25, 1983, Ser. No. 488,424
Term of patent 14 years
U.S. Cl. D2—400

280,864
TOILETRIES KIT BAG
James H. Allen, Covington, Ky., assignor to 'totes' incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,057
Term of patent 14 years
U.S. Cl. D3—39

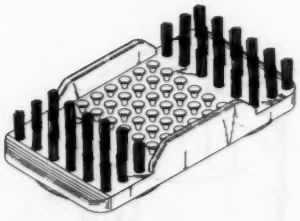


280,865
SOFT-SIDED LUGGAGE
Harvey Bomes, Wellesley Hills; John Pulichino, Wellesley; Jack Barber, Cambridge, all of Mass., and John Migliore, Barrington, R.I., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 31, 1983, Ser. No. 527,996
Term of patent 14 years
U.S. Cl. D3—48

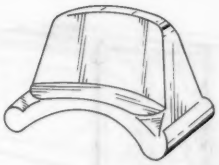
280,866
SOFT-SIDED CARRY-ON LUGGAGE
Harvey Bomes, Wellesley Hill; John Pulichino, Wellesley; Jack Barber, Cambridge, and Max Bell, Milford, all of Mass., assignors to American Tourister, Inc., Warren, R.I.
Filed Aug. 31, 1983, Ser. No. 528,042
Term of patent 14 years
U.S. Cl. D3—48

280,867
HAND & SHOULDER BAG
James H. Allen, Covington, Ky., assignor to 'totes' incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,058
Term of patent 14 years
U.S. Cl. D3—71

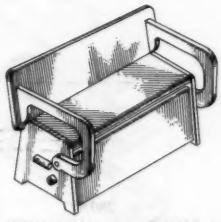
280,868
FOOT SCRUBBER
Bruce R. Russell, 5849 S. Greenleaf, Whittier, Calif. 90601
Filed Feb. 18, 1983, Ser. No. 467,776
Term of patent 14 years
U.S. Cl. D4—118



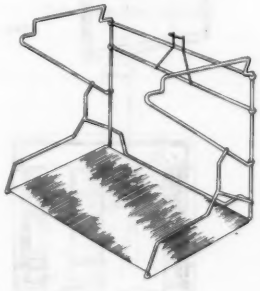
280,869
BOOK HOLDER
Jean R. Hauville, Le Crot du Lac-Montillot, Chatel-Censoir, France 89660
Filed Feb. 24, 1983, Ser. No. 469,242
Term of patent 14 years
U.S. Cl. D6—310



280,870
CONVERTIBLE SEAT
Leonard Eisen, Montvale, N.J., assignor to ZTI Ltd., Brooklyn, N.Y.
Filed Jun. 1, 1983, Ser. No. 500,188
Term of patent 14 years
U.S. Cl. D6—338



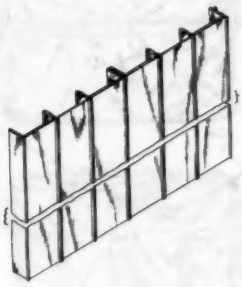
280,871
PLASTIC BAG HOLDING RACK
Alexander R. Provan, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 25, 1983, Ser. No. 488,515
Term of patent 14 years
U.S. Cl. D6—462



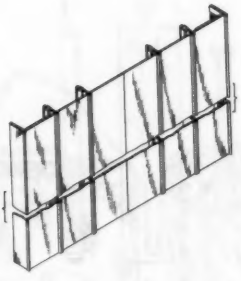
280,872
TRAY FOR ARTIST EASEL
Thomas B. Johnson, 10415 Crestover Dr., Dallas, Tex. 75229
Filed May 5, 1983, Ser. No. 491,913
Term of patent 14 years
U.S. Cl. D6—511

280,873
COMB HOLDER
Agnes Whidden, P.O. Box 13, Rte. #2, Moore Haven, Fla. 33471
Filed Jul. 25, 1983, Ser. No. 517,249
Term of patent 14 years
U.S. Cl. D6—553

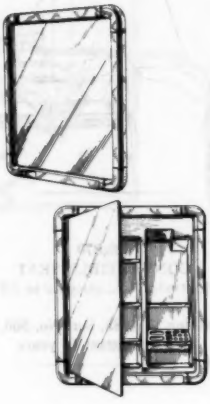
280,874
DRAPERY MODULE UNIT FOR DOORS, WINDOWS AND THE LIKE
Lyman N. Fairbanks, Arlington, Va., assignor to Custom Shade and Awning Corporation, Alexandria, Va.
Filed Jan. 5, 1983, Ser. No. 456,299
Term of patent 14 years
U.S. Cl. D6—575



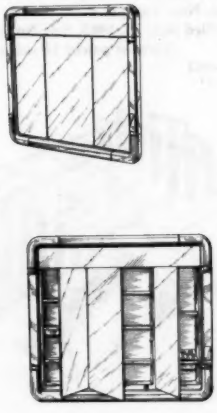
280,875
DRAPERY MODULE UNIT FOR DOORS, WINDOWS AND THE LIKE
Lyman N. Fairbanks, Arlington, Va., assignor to Custom Shade and Awning Corporation, Alexandria, Va.
Filed Apr. 11, 1983, Ser. No. 483,937
Term of patent 14 years
U.S. Cl. D6—575



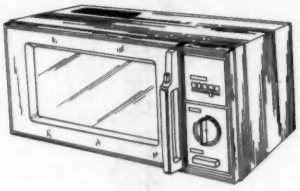
280,876
WALL MOUNTED MIRRORED CABINET
Jean P. Chabanet, Grenoble, France, assignor to Allibert S.A., Grenoble, France
Filed Jul. 7, 1983, Ser. No. 511,713
Term of patent 14 years
U.S. Cl. D6—559



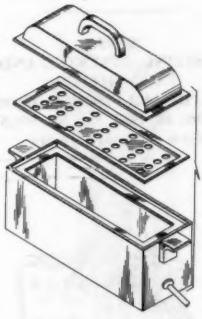
280,877
WALL MOUNTED MIRRORED CABINET
Jean P. Chabanet, Grenoble, France, assignor to Allibert S.A., Grenoble, France
Filed Jul. 7, 1983, Ser. No. 511,711
Term of patent 14 years
U.S. Cl. D6—561



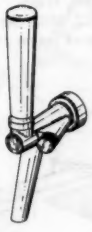
280,878
MICROWAVE OVEN
Jong S. Choi, Seoul, Rep. of Korea, assignor to Gold Star Company, Ltd., Seoul, Rep. of Korea
Filed Aug. 29, 1983, Ser. No. 527,090
Claims priority, application Rep. of Korea, May 6, 1983, 4963-83
Term of patent 14 years
U.S. Cl. D7—351



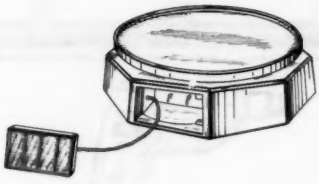
280,879
COMBINED FRYER AND STEAMER
Daisy Infante, 4234 Cumnor Rd., Downers Grove, Ill. 60515
Filed Feb. 22, 1983, Ser. No. 468,340
Term of patent 14 years
U.S. Cl. D7—354



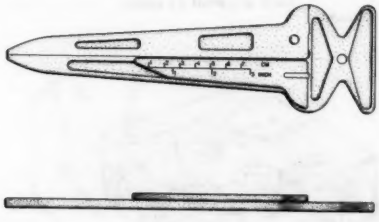
280,880
BEVERAGE DISPENSING VALVE
Josef Schweres, Langenfeld, Fed. Rep. of Germany, assignor to IMI Cornelius, Limited, Warwickshire, England
Filed Oct. 21, 1982, Ser. No. 435,865
Claims priority, application United Kingdom, Apr. 3, 1982, 1005983
Term of patent 14 years
U.S. Cl. D7—398



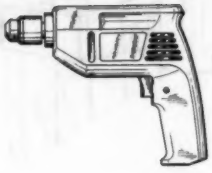
280,881
SOLAR CELL ACTIVATED TURNTABLE
Anthony Nolles, 100 Saw Mill Rd., North Haledon, N.J. 07508, and Wesley A. Le Marr, 79 Hobart Ave., Rutherford, N.J. 07070
Filed Feb. 22, 1983, Ser. No. 468,344
Term of patent 14 years
U.S. Cl. D8—1



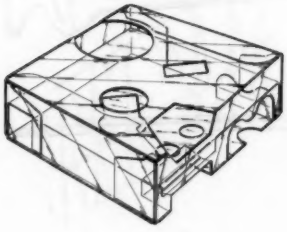
280,882
DEVICE FOR PLANTING SEEDS
Michael J. Rea, 65 St. Mary St., Chippenham, Wiltshire, England
Filed Mar. 29, 1983, Ser. No. 479,998
Term of patent 14 years
U.S. Cl. D8—2



280,883
PORTABLE ELECTRIC DRILL
Masakazu Sakamoto, Funabashi; Teruhisa Numata, Tokyo, and Etsushi Yamamoto, Ibara, all of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Dec. 29, 1983, Ser. No. 566,850
Claims priority, application Japan, Jul. 26, 1983, 58-33086
Term of patent 14 years
U.S. Cl. D8—68

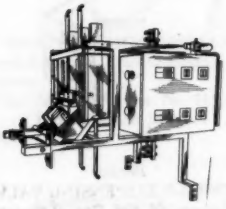


280,884
PACKAGING CONTAINER
Robert D. Holewinski, Lakehurst, and Leslie Hamilton, Trenton, both of N.J., assignors to J & J Dental Products Company, East Windsor, N.J.
Filed Mar. 9, 1983, Ser. No. 473,475
Term of patent 14 years
U.S. Cl. D9—345

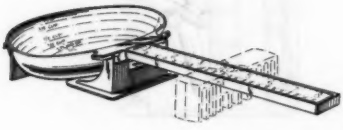


280,885
WRISTWATCH
Alain-Dominique Perrin, Rueil-Malmaison, France, assignor to Interdica S.A., Villars-Sur-Glane, Switzerland
Filed Oct. 6, 1982, Ser. No. 433,096
Claims priority, application France, Apr. 6, 1982, 821 203; Apr. 16, 1982, 821 342
Term of patent 14 years
U.S. Cl. D10—32

280,886
MACHINE FOR SIZING, STACKING AND COUNTING TACO SHELLS
William R. England, III, 2401 Stoneleigh, Garland, Tex. 75042
Filed Oct. 28, 1983, Ser. No. 546,516
Term of patent 14 years
U.S. Cl. D10—88



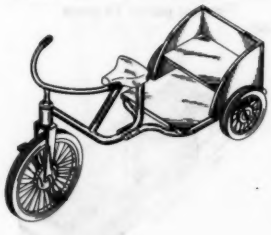
280,887
DIET SCALE
Charles W. H. Matthaei, Gig Harbor, Wash., assignor to Roman Meal Company, Tacoma, Wash.
Filed Feb. 22, 1983, Ser. No. 468,683
Term of patent 14 years
U.S. Cl. D10—90



280,888
COMBINED TIMEPIECE DIAL AND HANDS THEREFOR
Anthony Fago, 4333 W. 137th St., Cleveland, Ohio 44135
Filed Jun. 15, 1983, Ser. No. 504,510
Term of patent 14 years
U.S. Cl. D10—124

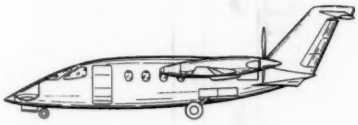
280,889
RISER FOR A TROPHY
Rego A. Bulone, Anaheim, Calif., assignor to Plastic Dress-Up Co., South El Monte, Calif.
Filed Sep. 30, 1983, Ser. No. 537,966
Term of patent 14 years
U.S. Cl. D11—164

280,890
TRICYCLE
Robert F. Trudo, and Martha J. Trudo, both of 804 Cagle, Harker Heights, Tex. 76543
Filed May 23, 1983, Ser. No. 496,965
Term of patent 14 years
U.S. Cl. D12—112

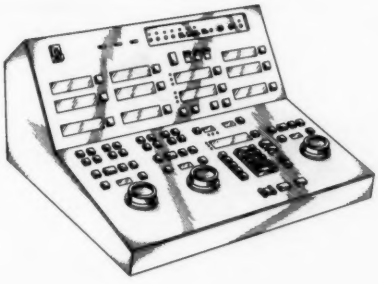


280,891
VEHICLE BUMPER
Jerome Belsky, and Michael Belsky, both of 1214 W. 254th St., Harbor City, Calif. 90710
Filed Feb. 8, 1982, Ser. No. 346,860
Term of patent 14 years
U.S. Cl. D12—169

280,892
AIRCRAFT
Alessandro Mazzoni, Genova, Italy, assignor to Rinaldo Piaggio S.p.A., Milan, Italy
Filed Jun. 10, 1982, Ser. No. 387,022
Claims priority, application Italy, Jan. 25, 1982, 20637 B/82
Term of patent 14 years
U.S. Cl. D12—332



280,893
CONTROL CONSOLE
Thomas K. Ueda, Foster City, Calif., assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 18, 1983, Ser. No. 485,969
Term of patent 14 years
U.S. Cl. D13—12



280,894

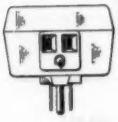
POWER LINE MONITOR

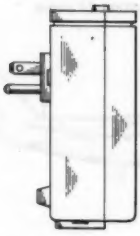
David V. Dickey, San Luis Obispo, Calif., assignor to Cuesta Systems, Incorporated, San Luis Obispo, Calif.

Filed Jan. 10, 1983, Ser. No. 457,027

Term of patent 14 years

U.S. Cl. D13—34





280,895

TELEPHONE HANDSET FOR MOBILE RADIO UNIT

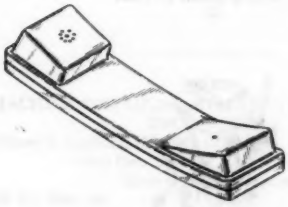
Tonis Kao, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 14, 1983, Ser. No. 484,978

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, MRBD9,NR. 13125

Term of patent 14 years

U.S. Cl. D14—53



280,896

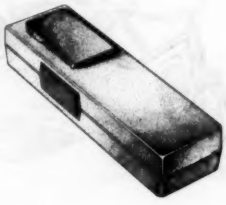
PORTABLE TRANSMITTER

John S. Campbell; John G. Engstrom, both of Indianapolis, Ind.; John N. McGarvey, Drexel Hill, Pa., and Michael P. Zambelli, Maplewood, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

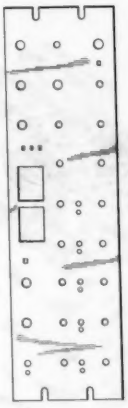
Filed May 27, 1983, Ser. No. 498,815

Term of patent 14 years

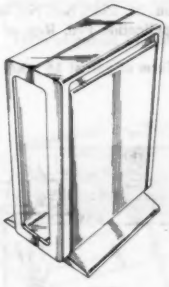
U.S. Cl. D14—95



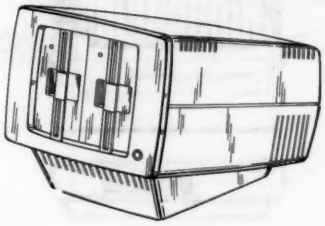
280,897
FRONT PANEL FOR A COMBINED AUDIO MIXER AND PREAMPLIFIER OR SIMILAR ARTICLE
Michael S. Marshak, 3970 Kumquat Ave., Miami, Fla. 33133
Filed Sep. 15, 1983, Ser. No. 532,545
Term of patent 14 years
U.S. Cl. D14—96



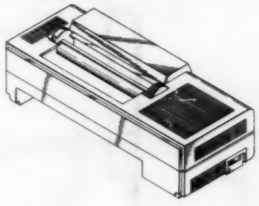
280,898
HOUSING FOR CENTRAL PROCESSING SYSTEMS OR SIMILAR ARTICLE
Paul E. Benigni, 100 Short St., Bridgewater, Mass. 02324; John C. Costello, 17 Wessex Rd., Newton Center, Mass. 02159; Jack G. Gregory, 118 Parker St. 23 C, Acton, Mass. 01720, and Stuart K. Morgan, 65 Leonard Rd., Boxboro, Mass. 01719
Filed Aug. 9, 1982, Ser. No. 406,411
Term of patent 14 years
U.S. Cl. D14—107



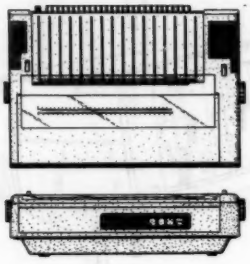
280,899
FLOPPY DISK MODULE
Benjamin Sherman, Fremont; Jo E. Burch, and Ralph M. Swan, both of Sunnyvale, all of Calif., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed Dec. 15, 1982, Ser. No. 449,963
Term of patent 14 years
U.S. Cl. D14—109



280,900
PRINTER
Tomoki Tsumura, Yokohama; Hiroshi Maruoka, Fujisawa; Toshio Asaji, Yokohama, and Mitsuru Yamamoto, Yamato, all of Japan, assignors to Panafacom Limited, Yamato, Japan
Filed Jan. 21, 1983, Ser. No. 459,941
Claims priority, application Japan, Jul. 22, 1982, 57-33203
Term of patent 14 years
U.S. Cl. D14—111

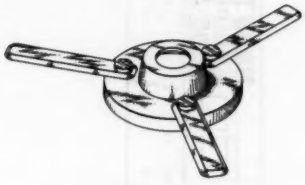


280,901
HOUSING FOR A DAISY WHEEL PRINTER
Daniel D. Fong, Oakland; Eugene A. Stoner, Pleasanton, and Young S. Kim, Sunnyvale, all of Calif., assignors to Telecopy, Inc., Santa Clara, Calif.
Filed Sep. 29, 1983, Ser. No. 537,312
Term of patent 14 years
U.S. Cl. D14—111

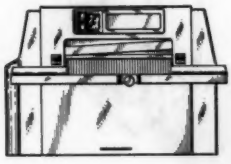


280,902
DRY BATTERY DRIVEN LIQUID PUMP
Eiki Maruyama, Nagano, Japan, assignor to Maruyama Industrial Co. Ltd., Kagano, Japan
Filed Feb. 9, 1983, Ser. No. 465,186
Claims priority, application Japan, Feb. 15, 1978, 53-5443
Term of patent 14 years
U.S. Cl. D15—7

280,903
CUTTING ATTACHMENT FOR A WEED TRIMMER
Larance E. Barbula, 9393 Barbula Hill, Newcastle, Calif. 95698
Filed Dec. 27, 1983, Ser. No. 565,446
Term of patent 14 years
U.S. Cl. D15—16

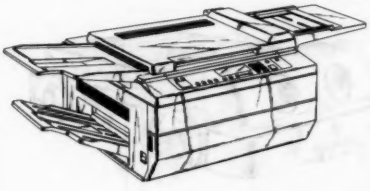


280,904
CUTTING MACHINE FOR PAPER, PAPERBOARD, BROCHURES OR THE LIKE
Friedrich Kruse, Sauerbruchstr. 3, 3012 Langenhagen, and Hans Hameyer, Wiesenstrasse 45, 3000 Hannover, both of Fed. Rep. of Germany
Filed Jan. 24, 1983, Ser. No. 460,132
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 82AR337/82
Term of patent 14 years
U.S. Cl. D15—129

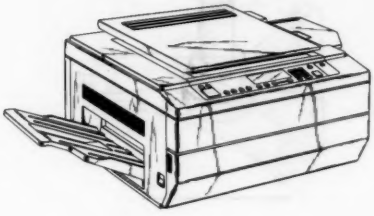


280,905
BRAKE LATHE
R. Warren Aldridge, Jr., Huntsville, Ala., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.
Continuation-in-part of Ser. No. 286,292, Jul. 23, 1981, Pat. No. Des. 270,058. This application Aug. 9, 1983, Ser. No. 521,603
Term of patent 14 years
U.S. Cl. D15—130

280,906
ELECTROPHOTOGRAPHIC COPYING MACHINE
Michio Imada, Kodaira, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Sep. 26, 1983, Ser. No. 535,704
Claims priority, application Japan, Apr. 12, 1983, SHO/58-15427
Term of patent 14 years
U.S. Cl. D16—31



280,907
ELECTROPHOTOGRAPHIC COPYING MACHINE
Michio Imada, Kodaira, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Sep. 26, 1983, Ser. No. 535,706
Claims priority, application Japan, Apr. 12, 1983, SHO/58-15428
Term of patent 14 years
U.S. Cl. D16—31

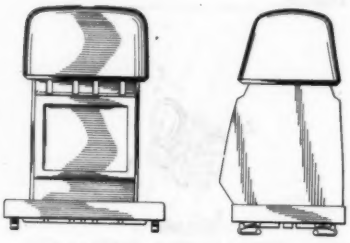


280,908
TRIPOD LEG LOCK
Koma Nakatani, Tokyo, Japan, assignor to Velbon International Corporation, Torrance, Calif.
Filed Oct. 22, 1982, Ser. No. 435,997
Term of patent 14 years
U.S. Cl. D16—45

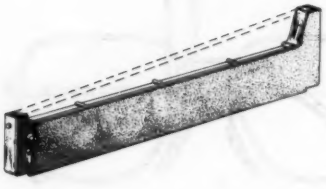
280,909
SPECTACLE FRAME
David R. Engelhardt, Adelaide, Australia, assignor to R. Engelhardt Nominees Pty. Ltd., Edwardstown, Australia
Filed Jan. 3, 1983, Ser. No. 455,273
Claims priority, application Australia, Dec. 8, 1982, 2328
Term of patent 14 years
U.S. Cl. D16—108

280,910
STAMP
Toshio Fujikura, Aichi, Japan, assignor to Shachihata Industry Co., Ltd., Nagoya, Japan
Filed Mar. 15, 1983, Ser. No. 475,474
Term of patent 14 years
U.S. Cl. D18—15

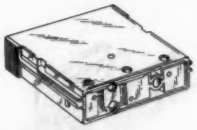
280,911
HAND OPERATED TYPE BAND INK STAMP
Nolan K. Rhoades, Beloit, Wis., assignor to Schwaab Inc., Milwaukee, Wis.
Filed Jun. 6, 1983, Ser. No. 501,516
Term of patent 14 years
U.S. Cl. D18—15



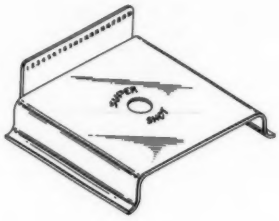
280,912
RIBBON CASSETTE FOR PRINTER
Chihiro Kosaka, 291 Shimotogari Nagaizumi-cho, Sunto-gun Shizuoka-ken, Japan
Filed Jun. 3, 1983, Ser. No. 500,983
Term of patent 14 years
U.S. Cl. D18—22



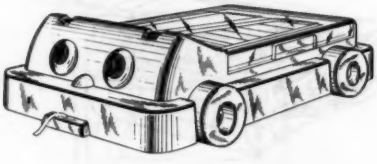
280,913
INK CARTRIDGE FOR PRINTER
Richard Nibley, and Akira Miyagawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 8, 1983, Ser. No. 559,453
Claims priority, application Japan, Jun. 13, 1983, 58-25418
Term of patent 14 years
U.S. Cl. D18—22



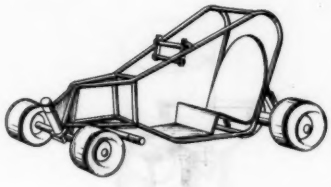
280,914
GAME TARGET
Bobby L. Willis, and Noemi R. Willis, both of Rte. 8, Box 640-H, Claremore, Okla. 74017
Filed Feb. 4, 1983, Ser. No. 463,821
Term of patent 14 years
U.S. Cl. D21—5



280,915
TOY XYLOPHONE
Pietro Catelli, Como, Italy, assignor to Artsana S.p.A., Italy
Filed Jul. 28, 1983, Ser. No. 518,132
Term of patent 14 years
U.S. Cl. D21—64

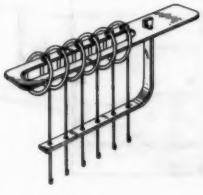


280,916
COASTER
Rhett Castle, P.O. Box 8066, Salem, Mass. 01970
Filed Apr. 7, 1983, Ser. No. 482,786
Term of patent 14 years
U.S. Cl. D21—71

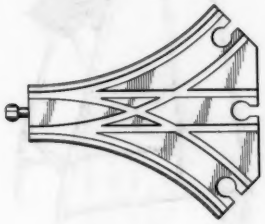


280,917
TOY VEHICLE
Arthur M. Skolnik, 612-36th Ave., Seattle, Wash. 98122
Filed Mar. 21, 1983, Ser. No. 477,357
Term of patent 14 years
U.S. Cl. D21—80

280,918
RING PUZZLE TOY
James C. Hallmark, 110 Robinwood Dr., Whitehouse, Tex. 75791
Filed Apr. 4, 1983, Ser. No. 481,910
Term of patent 14 years
U.S. Cl. D21—106

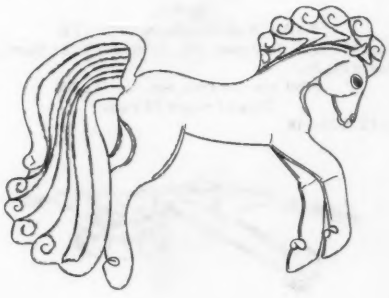


280,919
RAIL ELEMENT FOR A TOY RAILWAY
Nils A. I. Petersson, Killeberg, Sweden, assignor to Brio Toy AB, Osby, Sweden
Filed Jul. 14, 1982, Ser. No. 398,076
Claims priority, application Sweden, Jan. 22, 1982, 82-0129
Term of patent 14 years
U.S. Cl. D21—143



280,920
TOY ANIMAL FIGURE
Marilyn L. Conklin, Devon, Pa., assignor to Mattel, Inc.
Filed May 9, 1983, Ser. No. 492,530
Term of patent 14 years
U.S. Cl. D21—161

280,921
STUFFED HORSE
Diane Insetta, 8444 San Jose Blvd., Jacksonville, Fla. 32217
Filed Jul. 6, 1983, Ser. No. 511,214
Term of patent 14 years
U.S. Cl. D21—165



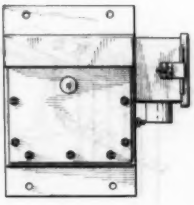
280,922
UPPER BODY EXERCISER
Stephen M. Sieder, 49 S. Elm St., Apt. C, Kutztown, Pa. 19530
Filed Dec. 1, 1983, Ser. No. 556,859
Term of patent 14 years
U.S. Cl. D21—191

280,923
EXERCISE BICYCLE
David B. Smith, Mercer Island; Randolph F. Miller, Mount Vernon, and John M. Moore, Woodinville, all of Wash., assignors to Precor Incorporated, Redmond, Wash.
Filed Aug. 15, 1984, Ser. No. 641,169
Term of patent 14 years
U.S. Cl. D21—194

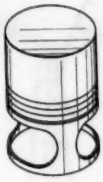
280,924
LAWN AND GARDEN SPRAYER
Robert M. Smith, Johnstown, Pa., assignor to R. M. Smith, Inc., Somerset, Pa.
Filed Jun. 25, 1982, Ser. No. 392,300
Term of patent 14 years
U.S. Cl. D23—18

280,925
FLOOR DRAIN
James M. Farnen, Kansas City, Mo., assignor to Drainage Products, Inc., Kansas City, Mo.
Filed Dec. 21, 1982, Ser. No. 451,967
Term of patent 14 years
U.S. Cl. D23—46

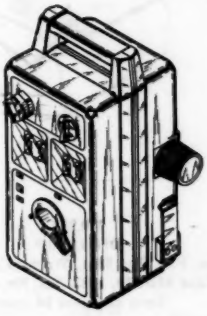
280,926
COMBINED HYDROGEN IGNITOR AND HOUSING FOR WALL MOUNTING
Marcus P. Cake; Harry W. Falter, both of Rocky Mount; Clement W. Batchelor, Spring Hope, and Michael A. Guarini, Rocky Mount, all of N.C., assignors to Morrison-Knudsen Company, Inc., Boise, Id.
Filed Dec. 10, 1982, Ser. No. 448,810
Term of patent 14 years
U.S. Cl. D23—127



280,927
AIR FRESHENER CONTAINER
Masamitsu Iwasaki, Tokyo, and Masamitsu Yamamoto, Funabashi, both of Japan, assignors to Uni-Charm Corporation, Ehime, Japan
Filed Mar. 7, 1983, Ser. No. 472,835
Claims priority, application Japan, Oct. 25, 1982, 57-48191
Term of patent 14 years
U.S. Cl. D23—150

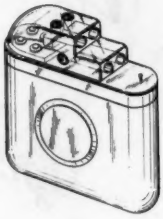


280,928
CONTROLLER FOR A DUAL DRUG DELIVERY SYSTEM
Denis H. Nelson, Poway, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Nov. 30, 1983, Ser. No. 556,671
Term of patent 14 years
U.S. Cl. D24—8

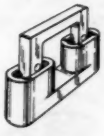


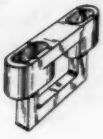
280,929
LIGHT UNIT FOR CURING DENTAL RESTORATIVE MATERIALS
Gregers Lystager, Vedbaek, Denmark, assignor to 3M A/S, Glostrup, Denmark
Filed Apr. 28, 1982, Ser. No. 372,566
Claims priority, application Denmark, Oct. 29, 1981, 81-1039
Term of patent 14 years
U.S. Cl. D24—10

280,930
AUTOMATIC IMPLANTABLE DEFIBRILLATOR
Vernon L. Speicher, Leechburg, and Mir Imran, Pittsburgh, both of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.
Filed Dec. 10, 1982, Ser. No. 448,746
Term of patent 14 years
U.S. Cl. D24—17

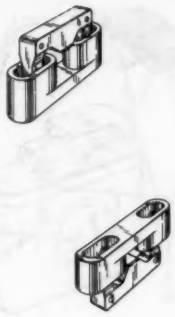


280,931
SURGICAL STAPLE
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Mar. 30, 1983, Ser. No. 480,423
Term of patent 14 years
U.S. Cl. D24—26

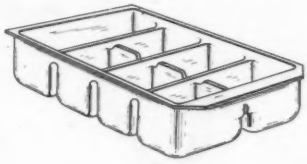




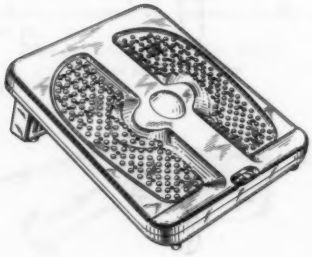
280,932
SURGICAL STAPLE
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Mar. 30, 1983, Ser. No. 480,443
Term of patent 14 years
U.S. Cl. D24—26



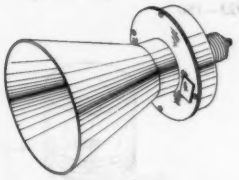
280,933
TRAY FOR MEDICINE DISPENSER
John T. McLaughlin, 1839 Risa Pl., Glendale, Calif. 91208
Filed Dec. 2, 1982, Ser. No. 446,342
Term of patent 14 years
U.S. Cl. D24—31



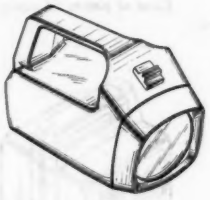
280,934
FOOT MASSAGER
Francis W. MacGregor, New Britain, Conn., assignor to Clairol Incorporated, New York, N.Y.
Filed Mar. 7, 1983, Ser. No. 472,791
Term of patent 14 years
U.S. Cl. D24—36



280,935
FLUORESCENT REFLECTOR FIXTURE
Denys L. Alcorn, 10071 Phelan Dr., Villa Park, Calif. 92667
Filed Oct. 20, 1983, Ser. No. 543,845
Term of patent 14 years
U.S. Cl. D26—26



280,936
LANTERN
Richard L. Dinsmore, and Martin V. Maloney, both of Skaneateles, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Sep. 1, 1983, Ser. No. 528,553
Term of patent 14 years
U.S. Cl. D26—48



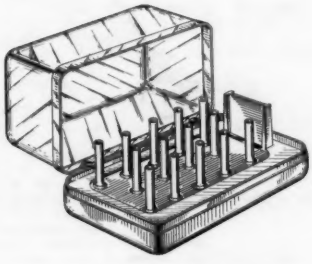
280,937
OIL LAMP
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Mar. 14, 1983, Ser. No. 474,836
Term of patent 14 years
U.S. Cl. D26—110

280,938
OIL LAMP
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Mar. 14, 1983, Ser. No. 474,837
Term of patent 14 years
U.S. Cl. D26—110

280,939
OIL LAMP
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Mar. 14, 1983, Ser. No. 474,839
Term of patent 14 years
U.S. Cl. D26—110

280,940
OIL LAMP
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Mar. 14, 1983, Ser. No. 475,229
Term of patent 14 years
U.S. Cl. D26—110

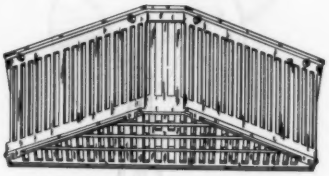
280,941
HAIR SETTER
Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Edison, N.J.
Filed Mar. 28, 1983, Ser. No. 479,885
Term of patent 14 years
U.S. Cl. D28—38

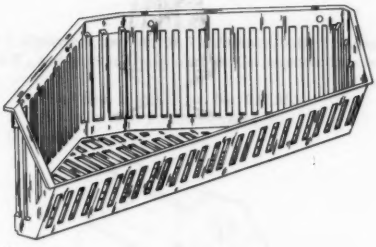


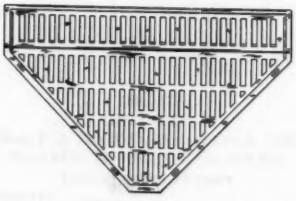
280,942
HAIR BARRETTE
Joan A. Topalian, 125 New Britain Dr., Warwick, R.I. 02889
Filed Mar. 2, 1983, Ser. No. 464,713
Term of patent 14 years
U.S. Cl. D28—42

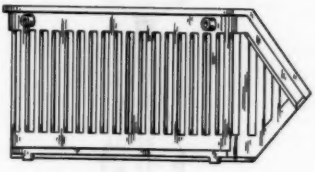
280,943
POWERED GOLF CART
Jocelyn D. Catford, 18a Golden Hill, Whitstable, Kent, England, assignor to Jocelyn David Catford, Whitstable, England
Filed Sep. 15, 1983, Ser. No. 532,597
Claims priority, application United Kingdom, Mar. 25, 1983, 1012155
Term of patent 14 years
U.S. Cl. D34—15

280,944
COMBINED STACKABLE TRAY AND/OR A CORNER WALL ATTACHABLE TRAY
Steven Herbert, Deerfield, Ill., assignor to Marley Tile, A.G., Zug, Switzerland
Filed Sep. 20, 1982, Ser. No. 419,981
Term of patent 14 years
U.S. Cl. D34—40









LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., 4,546,341, Cl. 337-177.000.

A. E. Staley Manufacturing Company: *See*—
Rosenburg, Dale W., 4,545,941, Cl. 260-410.700.

A. Monforts GmbH & Co.: *See*—
Schroer, Franz-Josef, 4,545,098, Cl. 26-89.000.

A. O. Smith Corporation: *See*—
Shaikh, Maqboolhusein G., 4,546,300, Cl. 318-786.000.

A/S Nunc: *See*—
Johansson, Arne; and Ajslev, Sven, 4,546,085, Cl. 435-284.000.

AB Gustaf Kahr: *See*—
Palmberg, Ulf, 4,546,440, Cl. 364-475.000.

Abbazia, Leonard P.: *See*—
Becker, Amy J.; Abbazia, Leonard P.; and Medri, Mario W., 4,545,989, Cl. 424-154.000.

Abe, Akira: *See*—
Kishimoto, Shinzo; Ohno, Shigeru; and Abe, Akira, 4,546,070, Cl. 430-393.000.

Abe, Yoshiaki; and Koyama, Masaaki. Multi-layer coating method based on spectral reflectance of white or gray colors. 4,546,007, Cl. 427-8.000.

Abel, Heinz, to Ciba-Geigy Corporation. Detergent composition for washing off dyeings obtained with fibre-reactive dyes and washing process comprising the use thereof. 4,545,919, Cl. 252-174.180.

Abeles, Benjamin: *See*—
Exxon Research and Engineering Co.; Tiedje, J. Thomas; Morel, Don L.; and Abeles, Benjamin, 4,546,009, Cl. 427-39.000.

Abildgaard, Niels: *See*—
Jensen, Hans-Erik K.; Abildgaard, Niels; and Nielsen, Steen H., 4,545,259, Cl. 73-861.280.

Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, to Nissan Motor Co., Ltd. Hydraulic control system for continuously variable V-belt transmission. 4,545,265, Cl. 74-868.000.

Abou-Gharbia, Magid A., to American Home Products Corporation. 1,4,5,6,7,8-Hexahydro-2-methyl-5-oxo-4-(2-thiazolyl)-3-quinoline carboxylic acid 2-methyl(phenylmethyl)amino ethyl ester and pharmaceutically acceptable salts. 4,546,186, Cl. 546-167.000.

Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., to American Home Products Corporation. Antiarrhythmic cyclooct[-b]indoles. 4,546,193, Cl. 548-448.000.

Abou, Shouji: *See*—
Suzuki, Yasoji; Sasaki, Itsuo; and Abou, Shouji, 4,546,327, Cl. 330-253.000.

Abramatic, Jean-Francois; Nadler, Morton; and Letellier, Philippe, to INRIA Institute National de Recherche en Informatique et en Automatique. Method and apparatus for visual telecommunications, in particular for use by the deaf. 4,546,383, Cl. 358-85.000.

Abu-Isa, Ismat A.; and McIntyre, Dorthie J., to General Motors Corporation. Thin elastomeric seat. 4,545,614, Cl. 297-284.000.

Accurate Metal Weather Strip Company: *See*—
Kammerer, Fred R., 4,545,566, Cl. 251-357.000.

Acme Resin Corporation: *See*—
Laitar, Robert A.; and Gomez, Eduardo, 4,546,124, Cl. 523-143.000.

Adam, Gunter, to PUMA-Sportschuhfabriken Rudolf Dassler KG. Racket with adjustable handle. 4,545,584, Cl. 273-73.00J.

Adamo, Michael D.; Darter, Cederick U.; and Cho, Frederick Y., to United States of America, Air Force. Conductor structure for thick film electrical device. 4,546,283, Cl. 310-313.00R.

Adams, Charles L., to PVI Industries, Inc. Water heater. 4,545,329, Cl. 122-17.000.

Adams, Graham L.; Briscoe, Peter F.; and Dyson, Arthur F., to Standard Telephones and Cables, Public Limited Company. Cold-welding of electrolytic capacitor rolls. 4,545,108, Cl. 29-570.000.

Addams, Charles F., Jr.: *See*—
Paul, Kermit D.; Addams, Charles F., Jr.; and Wuertele, Frederick S., 4,545,410, Cl. 141-18.000.

Adolph, Horst G.: *See*—
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Advanced Genetics Research Institute: *See*—
Giles, Richard E.; Stevens, David R.; and Wiesehahn, Gary P., 4,545,987, Cl. 424-89.000.

Aervoe-Pacific Company, Inc.: *See*—
Williams, David A., 4,545,531, Cl. 239-150.000.

Agata, Kazuhiro, to NEC Home Electronics, Ltd. Horizontal printing type printer. 4,545,695, Cl. 400-320.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Bergthaller, Peter; Odenwalder, Heinrich; and Matejec, Reinhard, 4,546,073, Cl. 430-543.000.

Ahner, Reinhard. Hand-operated press for treating vegetables or fruit. 4,545,299, Cl. 100-112.000.

Ahs, Vilgot, to Tocksfors Verkstads AB. Circuit arrangement for temperature control of an electric heating element. 4,546,238, Cl. 219-497.000.

Aihara, Kenji: *See*—
Sudoh, Chuzoh; Hagita, Hyoji; Asakawa, Motoo; Nagai, Hiroshi; and Aihara, Kenji, 4,545,227, Cl. 72-12.000.

Aihara, Yoshihiko, to Canon Kabushiki Kaisha. Focus detecting device. 4,545,665, Cl. 354-402.000.

Air Products and Chemicals, Inc.: *See*—
Hegarty, William P., 4,545,787, Cl. 55-16.000.
Liu, Yu-Nan; and Pervier, James W., 4,545,795, Cl. 62-11.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Morioka, Hiroaki; and Sakakibara, Naoji, 4,545,563, Cl. 251-298.000.

Aisin Warner Kabushiki Kaisha: *See*—
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Ajinomoto Co., Inc.: *See*—
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Ajslev, Sven: *See*—
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Aketagawa, Tokio: *See*—
Kasagi, Yoshitaka; and Aketagawa, Tokio, 4,546,377, Cl. 358-23.000.

Akiba, Yutaka; Futami, Toshio; and Suda, Teruo, to Hitachi, Ltd. Litz wire. 4,546,210, Cl. 174-114.00R.

Akimaru, Susumu: *See*—
Komatsu, Isamu; Anzai, Masayasu; Hoshi, Nobuyoshi; and Akimaru, Susumu, 4,545,325, Cl. 118-645.000.

Akiyama, Shigeo. Apparatus for supplying bags of pliable or easily flexible nature. 4,545,184, Cl. 53-571.000.

Aktiebolaget Draco: *See*—
Kjellin, Per G.; and Persson, Carl G. A., 4,546,182, Cl. 544-273.000.

Aktiebolaget Iggesunds Bruk: *See*—
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Akzo N.V.: *See*—
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Akzona Incorporated: *See*—
Lange, Wolfgang, 4,545,949, Cl. 264-170.000.

Alario, Joseph P.; Kosson, Robert; and Leszak, Edward, to Grumman Aerospace Corporation. Re-entrant groove heat pipe. 4,545,427, Cl. 165-104.260.

Alas, Jacques, to Valeo. Torsion damping device for an automotive clutch plate assembly with two friction washers, one of which is freely slidably mounted. 4,545,473, Cl. 192-106.200.

Alba, Emilio C.; and Pacho, Angel R. Voltage stabilizing transformer. 4,546,306, Cl. 323-308.000.

Alberino, Louis M.; Regelman, Dale F.; and Vespoli, Nancy P., to Upjohn Company, The. Process for the preparation of polyurea elastomers. 4,546,114, Cl. 521-51.000.

Alberta Energy Company Ltd.: *See*—
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., 4,545,892, Cl. 208-11.0LE.

Alcan International Limited: *See*—
Leone, Gino L., 4,546,229, Cl. 219-118.000.

Alcon Laboratories, Inc.: *See*—
Schafer, Doris; and Schafer, Rolf, 4,546,123, Cl. 523-106.000.

Alder, Robert L., to Smith International, Inc. In-hole motor tachometer. 4,545,241, Cl. 73-151.000.

Algieri, Aldo A., to Bristol-Myers Company. Substituted 1,2-diaminocyclobutene-3,4-diones. 4,546,188, Cl. 546-194.000.

Allegheny Ludlum Steel Corporation: *See*—
McCunn, Thomas H.; and Ziemianski, John P., 4,545,826, Cl. 148-12.00E.

Allen-Bradley Company: *See*—
Nolan, Dennis C., 4,546,424, Cl. 363-87.000.

Allied Corporation: *See*—
Brooks, Mark A.; Tomala, Ambrose; and Casey, Gary L., 4,545,339, Cl. 123-145.00A.
Casey, Gary L., 4,545,356, Cl. 123-527.000.
Smith, Stanley B., Jr., 4,545,680, Cl. 356-319.000.

Allington, Robert W.: *See*—
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Allis-Chalmers Corporation: *See*—
Shuler, Bernard R., 4,545,793, Cl. 55-355.000.

Allred, Neal C., III, to Lawing, Stephen E.; and Allred, Neal C., III. Cam shaft timing control device. 4,545,338, Cl. 123-90.150.

Alma Desk Company: *See*—
Dalton, Robert F., Jr., 4,545,168, Cl. 52-588.000.

Alphasil Incorporated: *See*—
Holmberg, Scott H.; and Flasck, Richard A., 4,545,112, Cl. 29-577.00R.

Alps Electric Co., Ltd.: *See*—
Kano, Mitsuru; and Kamijo, Yoshimi, 4,545,928, Cl. 252-518.000.

Amana Refrigeration, Inc.: *See*—
McCammon, Patrick R., 4,546,225, Cl. 219-10.55F.

Amano, Toshihiko: *See*—
Nakagawa, Tsuneo; Yamaguchi, Sadatsu; Amano, Toshihiko; and Asano, Kohzoh, 4,546,157, Cl. 526-247.000.

AMAX Inc.: *See*—
Chou, Eddie C. J.; and Cooperrider, Mark W., 4,545,814, Cl. 75-0.5AA.

Amberger, Charles J.; and Lingscheit, James N., to Ford Motor Company. Coated glass article as a new article of manufacture. 4,546,050, Cl. 428-630.000.

Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, to Warner-Lambert Company. Dental hygiene compositions. 4,545,979, Cl. 424-52.000.

Amelung, Kurt; and Peters, Manfred, to Buhlwe-Miag GmbH. Hurdle for malthouses and other material-handling spaces. 4,545,137, Cl. 34-233.000.

Amendola, Albert; Schmeckenbecher, Arnold F.; and Sobon, Joseph T., to International Business Machines Corporation. Process for forming a pattern of metallurgy on the top of a ceramic substrate. 4,546,065, Cl. 430-313.000.

American Cyanamid Company: *See*—
Chang, Eugene Y. C., 4,546,167, Cl. 528-64.000.
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,546,181, Cl. 544-225.000.

American District Telegraph Company: *See*—
Guscott, John K.; and Casamassima, Mario, 4,546,344, Cl. 340-501.000.

American Hoechst Corporation: *See*—
Metzner, Ernest K., 4,546,203, Cl. 562-538.000.

American Home Products Corporation: *See*—
Abou-Gharbia, Magid A., 4,546,186, Cl. 546-167.000.
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,546,193, Cl. 548-448.000.

American Hospital Supply Corporation: *See*—
Grossmann, Frederic; and Sims, Larry A., 4,545,371, Cl. 128-132.00D.

American Public Power Association: *See*—
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American Standard Inc.: *See*—
Lyons, Michael D., 4,545,402, Cl. 137-495.000.

Amoco Corporation: *See*—
Edwards, Robert C.; and Golson, F. Austin, 4,546,202, Cl. 562-414.000.

AMP Incorporated: *See*—
Bunnell, Edward D., 4,545,635, Cl. 339-99.00R.

Anastassiou, Dimitris, to International Business Machines Corporation. Data compression method for graphics images. 4,546,385, Cl. 358-133.000.

Anchor Hocking Corporation: *See*—
Asmus, Edward, 4,545,487, Cl. 206-508.000.

Anderson, Clifford L., to Eastman Kodak Company. Apparatus for guiding and cooling a heated image-carrying support. 4,545,671, Cl. 355-3.0SH.

Anderson-Cook, Inc.: *See*—
Jungesjo, Harald N., 4,545,230, Cl. 72-108.000.

Anderson, Edwin A.: *See*—
Webb, Derrel D.; and Anderson, Edwin A., 4,545,444, Cl. 175-296.000.

Anderson, Richard N.: *See*—
Gaillard, Adrianus J. C.; and Anderson, Richard N., 4,545,100, Cl. 29-24.500.

Ando, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Videodisc autofocus device. 4,546,460, Cl. 369-45.000.

Ando, Hisashi: *See*—
Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, 4,546,222, Cl. 200-144.00B.

Ando, Takayuki: *See*—
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Ando, Wataru: *See*—
Saitoh, Keishi; and Ando, Wataru, 4,546,008, Cl. 427-38.000.

Andrew, Sydney P. S., to Imperial Chemical Industries PLC. Method and apparatus to control the level of the air-to-fuel weight ratio in an internal combustion engine. 4,545,351, Cl. 123-440.000.

Andrews, Walter H. Translucent electronic board game with magnetic pawn. 4,545,582, Cl. 273-238.000.

Anicon, Inc.: *See*—
Campbell, Bryant A.; and Miller, Nicholas E., 4,545,327, Cl. 118-719.000.

Annegarn, Marcellinus J. J. C., to U.S. Philips Corporation. Movement detection circuit for a PAL television signal. 4,546,378, Cl. 358-31.000.

Antelope Oil Tool & Manufacturing Company: *See*—
Harrison, James E., 4,545,436, Cl. 166-241.000.

Anzai, Katsushi: *See*—
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Anzai, Masayasu: *See*—
Komatsu, Isamu; Anzai, Masayasu; Hoshi, Nobuyoshi; and Akimaru, Susumu, 4,545,325, Cl. 118-645.000.

Aoki, Susumu: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.

Appels, Johannes A.: *See*—
Maas, Henricus G. R.; Klaassen, Francois M.; and Appels, Johannes A., 4,545,110, Cl. 29-571.000.

Appleton Papers Inc.: *See*—
Brockett, Bruce W.; and Miller, Robert E., 4,546,365, Cl. 346-214.000.

Appleton, Robert P. Device for retrieving objects from wells. 4,545,432, Cl. 166-99.000.

Applied Power, Inc.: *See*—
Sonneborn, Lamburtus J., 4,545,408, Cl. 137-625.460.

APV Anderson Bros. Inc.: *See*—
Stohlquist, Roger H.; and Stenberg, Roger A., 4,545,183, Cl. 53-566.000.

APX Group, Inc.: *See*—
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, 4,545,605, Cl. 285-189.000.

Aranyosi, Miklos: *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.

Arioka, Takanori: *See*—
Kitada, Toyohiko; and Arioka, Takanori, 4,545,248, Cl. 73-597.000.

Arita, Masafumi: *See*—
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, 4,546,107, Cl. 514-411.000.

Arita, Yosihumi; Murakami, Yukihiro; and Yuasa, Miyabi, to Toray Industries, Inc. Apparatus for producing oxidized filaments. 4,545,762, Cl. 432-59.000.

Arjomari-Prioux: *See*—
Gomez, Daniel; and Bartoli, Giampaolo, 4,545,854, Cl. 162-135.000.

Armbruster, Gerhard; Schadlich, Fritz; and Seidel, Eberhard, to Robert Bosch GmbH. Hand-held power tool with circular-disk-shaped tool. 4,545,121, Cl. 30-374.000.

Armco Inc.: *See*—
Boynton, Jerald H., 4,545,703, Cl. 405-273.000.
Schoen, Jerry W.; and Young, Russel L., 4,545,828, Cl. 148-111.000.

Arndt, Kim E.; Rogers, Richard B.; and McCormick, Ronald W., to Dow Chemical Company, The. Soil treating method and composition for conserving nitrogen in soil. 4,545,803, Cl. 71-27.000.

Arnesen, Tore: *See*—
Arnesen, Tore C.; and Arnesen, Tore, 4,545,887, Cl. 204-280.000.

Arnesen, Tore C.; and Arnesen, Tore. Electrode for electrostatic water treatment. 4,545,887, Cl. 204-280.000.

Arnett, Jo A.: *See*—
Arnett, Joseph; and Arnett, Jo A., 4,545,282, Cl. 84-317.000.

Arnett, Joseph; and Arnett, Jo A. Chord selector device for stringed musical instruments. 4,545,282, Cl. 84-317.000.

Arraudeau, Jean-Pierre: *See*—
Gueret, Jean-Louis H.; and Arraudeau, Jean-Pierre, 4,545,393, Cl. 132-88.500.

Asahi Kakoshi Co., Ltd.: *See*—
Nakagawa, Yasuyuki, 4,545,839, Cl. 156-244.110.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Mutoh, Yoshihiko; Matsuda, Kazuo; Ohshima, Masashi; and Ohuchi, Hiroo, 4,545,940, Cl. 260-428.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Sato, Shigetada, 4,545,654, Cl. 350-454.000.

Asahi Yukizai Kogyo Co., Ltd.: *See*—
Sano, Nichiro; and Tsuno, Kazuhiko, 4,545,565, Cl. 251-331.000.

Asakawa, Motoo: *See*—
Sudoh, Chuzoh; Hagita, Hyoji; Asakawa, Motoo; Nagai, Hiroshi; and Aihara, Kenji, 4,545,227, Cl. 72-12.000.

Asami, Shojiro; and Sumihiro, Hiroshi, to Sony Corporation. Flexible magnetic disc cassette. 4,546,397, Cl. 360-99.000.

Asano, Kohzoh: *See*—
Nakagawa, Tsuneo; Yamaguchi, Sadatsu; Amano, Toshihiko; and Asano, Kohzoh, 4,546,157, Cl. 526-247.000.

Asano, Masao; Sunaga, Tetsuro; Murata, Hideki; and Matsumoto, Kazumasa, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,546,044, Cl. 428-413.000.

ASEA Aktiebolag: *See*—
Svedberg, Per, 4,546,401, Cl. 361-91.000.

Asepta AG Wil/SG: *See*—
Schmid, Harry, 4,545,498, Cl. 215-260.000.

Ashizawa, Masaaki: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.

Ashton, Robert H., to Heath Company. Dual channel curve tracer. 4,546,348, Cl. 340-715.000.

Asian Star, U.S.A., Inc.: *See*—
Chiang, Hsing-Hui, 4,545,313, Cl. 112-263.100.

Asmus, Edward, to Anchor Hocking Corporation. Food serving tray. 4,545,487, Cl. 206-508.000.

Aspen Laboratories, Inc.: *See—*
Cline, Albert L., 4,545,375, Cl. 128-303.140.

Asselin, Ovila. Heat insulated tie rod for concrete wall members. 4,545,163, Cl. 52-378.000.

Asuag-SSIH: *See—*
Ray, Claude; and Schaeren, Walter, 4,545,688, Cl. 368-291.000.

Asulab S.A. - ETA 72: *See—*
Gharadjedaghi, Fereydoun; and Guyenet, Jean-Francois, 4,545,649, Cl. 350-356.000.

AT&T Bell Laboratories: *See—*
Beni, Gerardo; Bridges, Thomas J.; Hackwood, Susan; and Lin, Chinlon, 4,545,713, Cl. 414-1.000.
Christmas, Walter P.; and Sanders, Bruce W., 4,546,468, Cl. 370-54.000.
DeVeau, George F., Jr.; and Miller, Calvin M., 4,545,644, Cl. 350-96.210.
Freyman, Ronald L.; and Rotblum, Yehuda, 4,546,276, Cl. 307-578.000.
Miller, David A. B., 4,546,244, Cl. 250-211.00J.
Sharpless, Charles H.; and Van Slooten, Robert W., 4,546,475, Cl. 371-49.000.
Tegethoff, Ronald H., 4,546,216, Cl. 179-170.200.

AT&T Technologies, Inc.: *See—*
Beatenbough, Charles M.; and Elliott, William A., 4,545,636, Cl. 339-105.000.
Cartwright, John S.; and Hurst, Jerry C., 4,545,761, Cl. 432-5.000.
Frazee, Ralph E., Jr.; Myers, Daryl L.; and Smithgall, David H., Sr., 4,545,542, Cl. 242-18.00A.
Kent, William C., 4,545,520, Cl. 228-180.100.

Atkinson, Anthony: *See—*
Harvey, Michael J.; and Atkinson, Anthony, 4,546,161, Cl. 527-312.000.

Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., to University of Manchester Institute of Science and Technology, The; and Simon-Hartley Limited. Growth of biomass. 4,545,909, Cl. 210-618.000.

Atlantic Richfield Company: *See—*
Curtin, Daniel J., 4,545,620, Cl. 299-4.000.
Li, Ying H.; and Bonnecaze, Bernard F., 4,545,132, Cl. 34-20.000.

Atochem: *See—*
Pralus, Christian, 4,545,918, Cl. 252-142.000.

Attaway, Julian J., to MM Systems Corporation. Moldings. 4,545,162, Cl. 52-255.000.

Au, Andrew N. S.: *See—*
Fouts, Robert W., Jr.; Au, Andrew N. S.; Miller, Burton E.; and Gotcher, Alan J., 4,545,926, Cl. 252-511.000.

Au, Andrew T., to Dow Chemical Company, The. Preparation of cyano(6-(substituted phenoxy)-2-pyridinyl)methyl esters of 3-(2,2-dihaloethenyl)-2,2-dimethylcyclopropane carboxylic acids. 4,546,189, Cl. 546-300.000.

Audren, Jean-Thierry; and Pelletier, Charlie, to Societe de Fabrication d'Instruments de Mesure. Electronic circuit for constant charge control of an electrostatic motor, in particular for an accelerometer or a rate gyro. 4,546,292, Cl. 318-116.000.

Auracher, Franz; and Keil, Rudolf, to Siemens Aktiengesellschaft. Prism coupler device for an optical waveguide. 4,545,642, Cl. 350-96.190.

Autodynamics Corporation of America: *See—*
Kowalsky, Martin I., 4,545,105, Cl. 29-469.500.

Avar, Geza: *See—*
Haas, Peter; Avar, Geza; and Grammes, Hartwig, 4,546,121, Cl. 521-164.000.

Avicola, Kenneth, to Exxon Production Research Co. Fiber optical modulator and data multiplexer. 4,545,253, Cl. 73-655.000.

Avidon, Yakov. Apparatus for electrostatic paint spraying. 4,545,536, Cl. 239-695.000.

Axiuk, Oleg: *See—*
Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, 4,545,858, Cl. 162-267.000.

Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, to Nihon Tokushu Noyaku Seizo K.K. Herbicidally active novel substituted phenylsulfonylurea derivatives and intermediates therefor. 4,545,944, Cl. 260-545.00R.

Ayache, Liliane: *See—*
Le Foyer de Costil, Carol; Ayache, Liliane; and Tisseyre, Jean-Paul, 4,545,990, Cl. 514-557.000.

Azrak-Hamway International, Inc.: *See—*
Pipa, William J.; and Turbowitz, Leslie D., 4,545,451, Cl. 180-70.100.

B. F. Goodrich Company, The: *See—*
Rundo, John R., 4,545,549, Cl. 242-158.40R.

B & H Manufacturing Company, Inc.: *See—*
Hoffmann, Wolfgang, 4,545,832, Cl. 156-86.000.

B & P Barnett Limited: *See—*
Collins, Anthony J., 4,545,358, Cl. 124-88.000.

Babcock-Hitachi Kabushiki Kaisha: *See—*
Morita, Shigeki; Masai, Tadahisa; Nakashita, Shigeto; Uemura, Toshio; Kouda, Fumio; and Nawata, Tsuyoshi, 4,545,307, Cl. 110-264.000.

Babcock & Wilcox Company, The: *See—*
Barnett, Daniel C., 4,545,235, Cl. 73-1.00G.
Dooley, Jimmy B., 4,545,711, Cl. 408-197.000.

Backe, Wolfgang; Weingarten, Franz; and Murrenhoff, Hubertus, to Linde Aktiengesellschaft. Control arrangements for regulating the speed of a hydrostatic energy consumer. 4,545,201, Cl. 60-420.000.

Bacon, Paul A.: *See—*
Blake, Colin C.; and Bacon, Paul A., 4,545,873, Cl. 204-109.000.

Badiali, Roberto: *See—*
Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, 4,545,191, Cl. 57-22.000.

Badische Corporation: *See—*
Gusack, James A.; and Smith, Thomas E., 4,545,835, Cl. 156-180.000.

Badura, Jan: *See—*
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

Baetz, Wolfgang; Graefer, Albrecht; and Low, Edgar, to Karl Schmidt Fabrik fur Giessereibedarf GmbH & Co. Nonskid box studs. 4,545,421, Cl. 164-397.000.

Bagaglia, Adriano; Marchetti, Renato; and Penco, Eugenio, to Selenia Industrie Eletroniche Associate, S.p.A. Sealed CO_2 laser. 4,546,482, Cl. 372-86.000.

Baggio, Horacio; Eckart, George R.; and DeBeradinis, Louis A., to Woodhead Industries, Inc. Mini center for electrical power distribution. 4,546,418, Cl. 362-85.000.

Bahder, Alice, legal representative: *See—*
Fryszczyn, Bogdan; Bahder, George, deceased; and Bahder, Alice, legal representative, 4,545,133, Cl. 34-21.000.

Bahder, George, deceased: *See—*
Fryszczyn, Bogdan; Bahder, George, deceased; and Bahder, Alice, legal representative, 4,545,133, Cl. 34-21.000.

Baker, Dale A., to Harnischfeger Corporation. Apparatus for checking alignment of tandem flangeless monorail wheels. 4,545,128, Cl. 33-203.000.

Bakken, Paula S. Waitress apron. 4,545,079, Cl. 2-48.000.

Balbo, Edoardo: *See—*
Brescia, Riccardo; Manini, Enrico; Balbo, Edoardo; and Scardovi, Alessandro, 4,546,361, Cl. 346-140.00R.

Balcke-Durr AG: *See—*
Fickelscher, Kurt G., 4,545,263, Cl. 74-640.000.

Balha, Frances R. Shopping cart. 4,545,591, Cl. 280-33.99C.

Balique, Georges A. Apparatus for recording, control and early detection of cardiovascular diseases. 4,545,387, Cl. 128-687.000.

Ballarini, John A.; and Hetland, Timothy A. Process for the direct electrodeposition of gray chromium on aluminum base substrates such as aluminum base lithographic sheets. 4,545,867, Cl. 204-33.000.

Ban, Itsuki; and Nakajima, Akihiro. Apparatus for removing torque ripples in a direct current motor. 4,546,294, Cl. 318-311.000.

Banks, Bruce A.: *See—*
Finke, Robert C.; and Banks, Bruce A., 4,545,553, Cl. 244-134.00D.

Banks, Reginald G. S.: *See—*
Sheppard, Christine M.; Puxley, David C.; Banks, Reginald G. S.; and McKenzie, Donald, 4,546,091, Cl. 502-84.000.

Banquy, David L., to Foster Wheeler Energy Corporation. Process for the production of oxygenated organic compounds such as methanol. 4,546,111, Cl. 518-703.000.

Barall, Heinz, to Hibar Systems Ltd. Metering pump. 4,545,507, Cl. 222-137.000.

Barbee, Robert B.; and Davis, Burns, to Eastman Kodak Company. Polyester resins useful for forming containers having improved gas barrier properties. 4,546,170, Cl. 528-302.000.

Barbosa, Joseph A.: *See—*
Cooper, Ellis; and Lindahl, Gerald, 4,546,245, Cl. 250-211.00K.

Barbour, Mathew: *See—*
Torrance, Donald M., 4,545,145, Cl. 47-48.500.

Barchechat, Shlomo; and Kolitsky, Norman, to Safe-Air Inc. Ventilation damper control system. 4,545,363, Cl. 126-285.00B.

Bare, Thomas M.: *See—*
Campbell, James B., Jr.; and Bare, Thomas M., 4,546,104, Cl. 514-293.000.

Barmag Barmer Maschinenfabrik AG: *See—*
Oberstrass, Detlev, 4,545,192, Cl. 57-105.000.

Barnard, Maxwell K.: *See—*
Herbert, Frank P.; and Barnard, Maxwell K., 4,546,435, Cl. 364-300.000.

Barnett, Daniel C., to Babcock & Wilcox Company, The. Gas analyzer with aspirated test gas. 4,545,235, Cl. 73-1.00G.

Barnett, Ronald E.: *See—*
Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., 4,545,999, Cl. 426-548.000.
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,546,000, Cl. 426-548.000.

Barre, Claude, to Siemens Aktiengesellschaft. Integrated logic element in E^2CL technology. 4,546,271, Cl. 307-443.000.

Barreca, John R. Peristaltic pump. 4,545,745, Cl. 417-477.000.

Barriquand: *See—*
Barriquand, B.; Villard, F.; Martin, M.; Tridon, M.; and Pignal, M., 4,545,135, Cl. 34-58.000.

Barriquand, B.; Villard, F.; Martin, M.; Tridon, M.; and Pignal, M., to Barriquand; and Robatel. Installations for spin-drying fibrous or porous materials. 4,545,135, Cl. 34-58.000.

Barrom, Donna L.: *See—*
Russ, Julio G.; and Barrom, Donna L., 4,545,983, Cl. 424-63.000.

Barry, Kevin M. Positioning system for embroidery hoop. 4,545,127, Cl. 33-180.00R.

Bartashevich, Svyatoslav A.: *See—*
Stepanenko, Alexandr V.; Voitov, Vladimir G.; Klimenkov, Stepan S.; Bartashevich, Svyatoslav A.; and Karpitsky, Viktor S., 4,545,229, Cl. 72-73.000.

Barthold, Klaus: *See*—
Baur, Richard; Oppenlander, Knut; Strickler, Rainer; and Barthold, Klaus, 4,546,151, Cl. 525-430.000.

Bartlett, John C.; Bohnhoff, Alan E.; Croley, Donald F.; Dyer, Stanley; Edds, Kenneth E.; Horlander, Frank J.; and Stafford, Donald W., to International Business Machines Corporation. Drive for thermal printing lift-off correction. 4,545,693, Cl. 400-120.000.

Bartnik, Friedhelm: *See*—
Moller, Hinrich; Wallat, Siegfried; and Bartnik, Friedhelm, 4,545,984, Cl. 424-70.000.

Bartoli, Giampaolo: *See*—
Gomez, Daniel; and Bartoli, Giampaolo, 4,545,854, Cl. 162-135.000.

Barton, Carlos L.: *See*—
Simpson, Scott S.; Yeznach, Anthony; and Barton, Carlos L., 4,546,118, Cl. 521-130.000.

Barton, Donald L., to Hewlett-Packard Company. Planarization of dielectric films on integrated circuits. 4,545,852, Cl. 156-643.000.

Bas, Olov A., to Hudiksvalls Mekaniska Aktiebolag. Arrangement in vehicles with articulated steering. 4,545,454, Cl. 180-139.000.

BASF Aktiengesellschaft: *See*—
Baur, Richard; Oppenlander, Knut; Strickler, Rainer; and Barthold, Klaus, 4,546,151, Cl. 525-430.000.
Horacek, Heinrich; Wittmann, Otto; Marx, Matthias; and Mayer, Johann, 4,546,039, Cl. 428-357.000.
Jahn, Dieter; Becker, Rainer; Keil, Michael; Spiegler, Wolfgang; and Wuerzer, Bruno, 4,545,806, Cl. 71-88.000.

Bassa, Altan, to Du Pont de Nemours, E. I., and Company. Vacuum box with variable stage volume to improve coating uniformity. 4,545,321, Cl. 118-50.000.

Bateman, Glean; and DuPuy, Richard E., Jr., to Tektronix, Inc. Nonlinear amplifier systems for repetitive signals. 4,546,321, Cl. 328-142.000.

Bateman, Neil E.; and Woods, Ross A., to R. P. Scherer Corporation. Pharmaceutical composition and process for the manufacture thereof. 4,546,197, Cl. 560-66.000.

Baucom, Keith B., to SCM Corporation. Perfluoro-keto-ylids as precursors of polychloroketones, 1,2-diketones and quinoxalines. 4,546,184, Cl. 544-353.000.

Bauer, Bernhard: *See*—
Hafner, Gunther; Noreikat, Karl-Ernst; Schmidt, Hans-Dieter; Letsche, Ulrich; and Bauer, Bernhard, 4,546,426, Cl. 364-153.000.

Bauer, Daniel: *See*—
Kalopissis, Gregoire; Gallien, Jacqueline; Jacquet, Bernard; Bauer, Daniel; and Chalaye, Jean Phillipe, 4,545,978, Cl. 424-10.000.

Bauer, Hans J.; and Garben, Bernd, to International Business Machines Corporation. Method and apparatus for making ohmic and/or Schottky barrier contacts to semiconductor substrates. 4,545,115, Cl. 29-590.000.

Bauer, Siegfried: *See*—
Stockburger, Hermann; and Bauer, Siegfried, 4,546,242, Cl. 235-454.000.

Baujat, Jacques: *See*—
Feurgard, Rene ; and Baujat, Jacques, 4,545,562, Cl. 251-129.200.

Baum, Dean O.: *See*—
Cochran, Gary L.; and Baum, Dean O., 4,545,720, Cl. 414-723.000.

Baum, Frank M. Belt-supported camera bag. 4,545,414, Cl. 150-52.00J.

Baumann, Ubald A., to Marmet Corp. Glazed curtain wall construction. 4,545,161, Cl. 52-235.000.

Baur, Richard; Oppenlander, Knut; Strickler, Rainer; and Barthold, Klaus, to BASF Aktiengesellschaft. Oxyalkylated polyamidoamines and their preparation. 4,546,151, Cl. 525-430.000.

Bay, Paul G.; Boyer, Nicodemus E.; and Sienkowski, Kenneth J., to PPG Industries, Inc. Polybromo dinaphthyl ethers. 4,546,139, Cl. 524-367.000.

Bayer Aktiengesellschaft: *See*—
Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,546,165, Cl. 528-53.000.
Haas, Peter; Avar, Geza; and Grammes, Hartwig, 4,546,121, Cl. 521-164.000.
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,546,079, Cl. 435-71.000.
Muller, Hanns P.; Hettel, Hans; Wagner, Kuno; and Vogtel, Peter, 4,546,116, Cl. 521-106.000.
Schmidt, Thomas, 4,546,178, Cl. 544-182.000.
Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, 4,545,994, Cl. 514-514.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,546,138, Cl. 524-326.000.
Zecher, Wilfried; Dunwald, Willi; Merten, Rudolf; and Reinking, Klaus, 4,546,162, Cl. 528-67.000.

BBC Aktiengesellschaft Brown, Boveri & Cie: *See*—
Nicoll, Andrew R., 4,546,052, Cl. 428-679.000.

BBC Brown, Boveri & Company, Limited: *See*—
Holenstein, Hans, 4,546,286, Cl. 313-296.000.
Killer, Eric; Scherer, Gunther; and Stucki, Samuel, 4,546,010, Cl. 427-96.000.

BCDS Corporation: *See*—
Waide, William M., 4,545,336, Cl. 123-55.0AA.

Beatenbough, Charles M.; and Elliott, William A., to AT&T Technologies, Inc. Methods of and assemblies for strain relieving connectorized flat cable. 4,545,636, Cl. 339-105.000.

Becherer, Daryl. Remote control water fowl retrieving device. 4,545,315, Cl. 114-61.000.

Bechtel International Corporation: *See*—
Brooks, Paul S., 4,545,124, Cl. 33-169.00D.

Bechtel, Klaus, to Erwin Sick GmbH Optik-Elektronik. Light barrier with spectrally filtered reflection means. 4,546,246, Cl. 250-221.000.

Beck, Lee R.: *See*—
Meyers, William E.; and Beck, Lee R., 4,546,083, Cl. 435-240.000.

Becker, Amy J.; Abbazia, Leonard P.; and Medri, Mario W., to Warner-Lambert Company. Chewable comestible product. 4,545,989, Cl. 424-154.000.

Becker, Rainer: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; Spiegler, Wolfgang; and Wuerzer, Bruno, 4,545,806, Cl. 71-88.000.

Beckett, Joel M., to Marq Packaging Systems, Inc. Programmable random size case sealing machine. 4,545,175, Cl. 53-69.000.

Beckman Instruments, Inc.: *See*—
Zysman, Lawrence J.; and Greene, Malbone W., 4,545,690, Cl. 374-165.000.

Beckman, John H.: *See*—
Nausedas, Joseph A.; and Beckman, John H., 4,545,091, Cl. 17-49.000.

Becton, Dickinson and Company: *See*—
Chupp, Vernon L., 4,545,677, Cl. 356-39.000.

Beelmann, Richard; and Kerstges, Johannes, to Deutsche Babcock Werke Aktiengesellschaft. Mill with blower impeller. 4,545,727, Cl. 415-206.000.

Beer, Henri B.: *See*—
de Nora, Vittorio; and Beer, Henri B., 4,545,886, Cl. 204-252.000.

Beghin-Say S.A.: *See*—
Holvoet, Marcel; and Picard, Bernard, 4,546,027, Cl. 428-109.000.

Behringwerke Aktiengesellschaft: *See*—
Dopatka, Hans-Detlef, 4,545,958, Cl. 422-102.000.

Beisswenger, Siegfried; and Boppel, Wolfgang, to Ing. Rudolf Hell GmbH. Method for the topically precise subsequent engraving of printing cylinders. 4,546,232, Cl. 219-121.0EJ.

Beiter, Werner. Blood lancet. 4,545,376, Cl. 128-314.000.

Bellmann, Bernhard G.; Birkner, Horst W.; and Kaminsky, Theo, to Santrade Ltd. Tool carrying magazine for a tool handling machine. 4,545,107, Cl. 29-568.000.

Bello, Vincent G.; and Sweeting, Charles W., to United Technologies Corporation. Flyback feedforward pulse width modulation regulator. 4,546,421, Cl. 363-21.000.

Belorussky Politekhnichesky Institut: *See*—
Stepanenko, Alexandr V.; Voitov, Vladimir G.; Klimenkov, Stepan S.; Bartashevich, Svyatoslav A.; and Karpitsky, Viktor S., 4,545,229, Cl. 72-73.000.

Belter, Lothar; and Stoecker, Alberto, to Schaeffer Scovill Verbindungstechnik GmbH. Fastener for waistbands or the like. 4,545,096, Cl. 24-585.000.

Ben-Shmuel, Sonja. Centrifugal apparatus for making coffee. 4,545,296, Cl. 99-289.00P.

Benenati, Salvatore. Heat exchanging electronic module housing. 4,546,407, Cl. 361-386.000.

Beni, Gerardo; Bridges, Thomas J.; Hackwood, Susan; and Lin, Chinlon, to AT&T Bell Laboratories. Waveguide robot system for laser beam. 4,545,713, Cl. 414-1.000.

Benjamin, James A.: *See*—
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,546,367, Cl. 357-23.400.

Bennett, Julian; and Salsby, Bernard, to National Plastics Limited. Container closure. 4,545,499, Cl. 215-352.000.

Benson, Lloyd R., to Triangle Grinding Inc. Insert retaining apparatus. 4,545,705, Cl. 407-108.000.

Benton, Thomas K.; and Seay, James R., to Combustion Engineering, Inc. Apparatus for measuring fluid flow rate in a two-phase fluid stream. 4,545,260, Cl. 73-861.650.

Benz, Gunter: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,546,079, Cl. 435-71.000.

Bergamo, Robert L.: *See*—
Lambert, Robert L.; Nagel, Judy A.; and Bergamo, Robert L., 4,546,064, Cl. 430-270.000.

Bergez, Pierre; Deguelte, Alain; and Seigneurin, Laurent, to Commissariat a l'Energie Atomique. Process for the preparation of porous products based on cobalt fluoride or lead fluoride. 4,545,964, Cl. 423-138.000.

Bergland, Paul W., to Zerand Corporation. Web apparatus with variable repeat interval. 4,545,518, Cl. 226-139.000.

Bergsma, Calvin D. Photographic modifier method and apparatus for graphics and the like. 4,545,673, Cl. 355-52.000.

Bergthaller, Peter; Odenwalder, Heinrich; and Matejec, Reinhard, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material containing a precursor of a photographically-active compound. 4,546,073, Cl. 430-543.000.

Bergwerksverband GmbH: *See*—
Schilling, Hans-Dieter; and Holl, Lothar, 4,545,959, Cl. 422-142.000.

Bernhard Forster GmbH: *See*—
Forster, Rolf, 4,545,760, Cl. 433-18.000.

Berol Kemi AB: *See*—
Hellsten, Karl M. E., 4,545,898, Cl. 209-166.000.

Berry, William W., to International Minerals & Chemical Corp. Recovery of uranium from a mixture of western uranium ore and phosphate rock. 4,545,962, Cl. 423-20.000.

Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, to Officine Savio SpA. Splicer device to splice textile yarns mechanically. 4,545,191, Cl. 57-22.000.

Besch, Creighton J., to Conveyor Sales & Mfg. Co. Chain conveyor. 4,545,477, Cl. 198-841.000.

Beseda, Viliam: *See—*
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

Beth Israel Medical Center: *See—*
Mosbach, Erwin H.; Une, Misuho; and McSherry, Charles K., 4,545,938, Cl. 260-397.100.

Bezwada, Rao S.: *See—*
Koelmel, Donald F.; Jamiolkowski, Dennis D.; Shalaby, Shalaby W.; and Bezwada, Rao S., 4,546,152, Cl. 525-437.000.

Biella-Neher AG.: *See—*
Rohner, Benedikt, 4,545,484, Cl. 206-425.000.

Bielomatik Leuze GmbH & Co.: *See—*
Seefeldt, Joachim, 4,545,715, Cl. 414-36.000.

Biewald, Heinz; Gronebaum, Theo; and Kuper, Hans-Heinrich. Machine for assembling veneer strips. 4,545,845, Cl. 156-544.000.

Bifok AB: *See—*
Karlberg, Bo I.; and Thelander, Sidsel, 4,546,088, Cl. 436-178.000.

Bilek, Paul J.; Flinn, Richard A.; McCluhan, Thomas K.; and Trojan, Paul K., to Elkem Metals Company. Alloy useful for producing ductile and compacted graphite cast irons. 4,545,817, Cl. 75-123.00E.

Bingham, David; Evans, Lee L.; and Bradshaw, Peter D., to Intersil, Inc. Digitally switched analog signal conditioner. 4,546,324, Cl. 330-9.000.

Bio-Care, Incorporated: *See—*
Miller, Gregory R.; and Clark, Steven G., 4,545,790, Cl. 55-161.000.

Birkner, Horst W.: *See—*
Bellmann, Bernhard G.; Birkner, Horst W.; and Kaminsky, Theo, 4,545,107, Cl. 29-568.000.

Bisey, Robert P. Musical keyboard instrument support device. 4,545,280, Cl. 84-177.000.

Bisgaard, Hans F.; and Jensen, Jorgen D., to Jensen, Jens C. Feeding bottle having an air intake valve. 4,545,491, Cl. 215-11.00D.

Bitha, Panayota: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,546,181, Cl. 544-225.000.

Black, Geoffrey M.: *See—*
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,545,909, Cl. 210-618.000.

Blackstone, Scott C.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., to RCA Corporation. Vertical IGFET with internal gate and method for making same. 4,546,375, Cl. 357-23.400.

Blaesi, John E.: *See—*
Stewart, William S.; and Blaesi, John E., 4,545,894, Cl. 208-311.000.

Blake, Colin C.; and Bacon, Paul A., to Ciba-Geigy AG. Vessel for an unstable solution of a metal salt or complex and method for sealing such vessel. 4,545,873, Cl. 204-109.000.

Blakeway, Douglas H.: *See—*
Wheeler, David C.; and Blakeway, Douglas H., 4,546,420, Cl. 362-268.000.

Bland, Terry E.: *See—*
Funk, Gary L.; and Bland, Terry E., 4,545,971, Cl. 423-359.000.

Blaschim S.p.A.: *See—*
Piccolo, Oreste; Villa, Giovanni; and Zen, Enrico, 4,546,201, Cl. 562-401.000.

Blaser, Eric: *See—*
Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, 4,545,979, Cl. 424-52.000.

Bleckmann, Hans-Wilhelm; Loreck, Heinz; Fennel, Helmut; and Zydeck, Michael, to ITT Industries, Inc. Method and circuit for the control of a brake slip control apparatus. 4,546,437, Cl. 364-426.000.

Bloch, Peter; Donner, Meinrad; and Schwaighofer, Roman, to Maag Gear-Wheel and Machine Company Limited. Gear grinding machine including a double-cone shaped grinding wheel. 4,545,151, Cl. 51-52.00R.

Block, Michael J.: *See—*
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., 4,545,859, Cl. 201-17.000.

Blum, Ronald D., to Tie-Tite Products, Inc. Reusable tying device. 4,545,138, Cl. 36-51.000.

Blust, Dale K.: *See—*
Rockerath, John L.; and Blust, Dale K., 4,545,544, Cl. 242-55.000.

BOC Group, Inc., The: *See—*
Gruber, Arthur W.; and Smith, Loren C., 4,545,400, Cl. 137-467.000.
Mukerjee, Ajit K.; Kearns, Patrick J.; and Rieman, Davis J., 4,545,134, Cl. 34-27.000.

Boehringer Ingelheim KG: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Traunecker, Werner; and Reichl, Richard, 4,546,102, Cl. 514-259.000.

Boeing Company, The: *See—*
Grabos, Fred F., 4,545,102, Cl. 29-407.000.
Pinson, George T., 4,546,264, Cl. 290-54.000.

Bohnhoff, Alan E.: *See—*
Bartlett, John C.; Bohnhoff, Alan E.; Croley, Donald F.; Dyer, Stanley; Edds, Kenneth E.; Horlander, Frank J.; and Stafford, Donald W., 4,545,693, Cl. 400-120.000.

Boise Cascade Corporation: *See—*
Novatny, Donald F., 4,545,482, Cl. 206-320.000.

Boles, Sol, to Grumman Aerospace Corporation. Range/azimuth ship imaging for ordnance control. 4,546,354, Cl. 343-17.000.

Boles, Sol, to Grumman Aerospace Corporation. Range/azimuth/elevation ship imaging for ordnance control. 4,546,355, Cl. 343-17.000.

Bondiou, Jean-Claude; Hodac, Francoise; and Legroux, Didier, to Pharmuka Laboratoires. Process for the preparation of derivatives of quinuclidine substituted in the 3 position. 4,546,185, Cl. 546-133.000.

Bones, Roger J.: *See—*
Coetzer, Johan; Galloway, Roy C.; Bones, Roger J.; Teagle, David A.; and Moseley, Patrick T., 4,546,055, Cl. 429-103.000.

Bonhomme, Bernard, to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques. Apparatus for welding connections of components. 4,546,228, Cl. 219-85.00R.

Bonnecaze, Bernard F.: *See—*
Li, Ying H.; and Bonnecaze, Bernard F., 4,545,132, Cl. 34-20.000.

Booth, Eric, to National Research Development Corporation. Mobile chair with elevating seat. 4,545,616, Cl. 297-320.000.

Boppel, Wolfgang: *See—*
Beisswenger, Siegfried; and Boppel, Wolfgang, 4,546,232, Cl. 219-121.0EJ.

Bordsen, Donald T.: *See—*
Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., 4,546,430, Cl. 364-200.000.

Borg-Warner Chemicals, Inc.: *See—*
Valdiserri, Leo L.; and Woodbury, Richard P., 4,546,180, Cl. 544-214.000.

Bosen, Sidney F.; and Perlson, Bruce D., to Norchem, Inc. Corrosion inhibited freeze protected heat transfer fluid. 4,545,925, Cl. 252-389.00A.

Bosshard, Andreas; and Lammler, Bernhard, to Huber & Suhner AG. Plug connector and method for connecting same. 4,545,637, Cl. 339-177.00E.

Bosso, Alexander: *See—*
Howard, Guy D.; and Bosso, Alexander, 4,545,305, Cl. 110-165.00R.

Bostic, Steve. Container and storage system for photographic prints and negatives. 4,545,486, Cl. 206-455.000.

Botnick, Irlin H., to Josam Developments, Inc. Ablution faucet. 4,545,533, Cl. 239-282.000.

Bournay, Frederick M., Jr.; and Giurtino, Joel F., to Cordis Corporation. Adapter for converting a metal encapsulated implantable cardiac pacer to an externally worn cardiac pacer. 4,545,381, Cl. 128-419.00P.

Bowden, Edgar A., to Mobil Oil Corporation. Method for regulating current flow through core samples. 4,546,318, Cl. 324-376.000.

Boyer, Nicodemus E.: *See—*
Bay, Paul G.; Boyer, Nicodemus E.; and Sienkowski, Kenneth J., 4,546,139, Cl. 524-367.000.

Boynton, Jerald H., to Armco Inc. Concrete faced bin wall. 4,545,703, Cl. 405-273.000.

Bozoarth, David B.; and Rickel, William R., to Whirlpool Corporation. Method of strengthening polypropylene hose. 4,545,947, Cl. 264-150.000.

Braathen, Thor F. Clamp connector for pipes. 4,545,604, Cl. 285-12.000.

Brader, Kurt: *See—*
Grether, Paul; Brader, Kurt; and Keller, Bruno, 4,545,160, Cl. 52-172.000.

Bradley, Earl C.: *See—*
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Bradley, Earl C., Jr.; and vander Linden, John, to Bradley, Earl C. Drilling device for pipe joints. 4,545,707, Cl. 408-111.000.

Bradshaw, Peter D.: *See—*
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Bramlage GmbH: *See—*
Mettenbrink, Herbert, 4,545,510, Cl. 222-209.000.

Brand, Julia A.; and Morgan, Lee W., to S. C. Johnson & Son, Inc. Bulk polymerization process for preparing high solids and uniform copolymers. 4,546,160, Cl. 526-320.000.

Brand, Michael J.; and Callejas, Ricardo J., to Phillips Petroleum Company. Fractional distillation. 4,545,895, Cl. 208-351.000.

Brandon, Kenneth F.: *See—*
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Bras, Jean, to Ste. Gaz de France. Stirling cycle or compressor-type thermal engine having a power source positioned externally to or internally to its cylinders. 4,545,205, Cl. 60-525.000.

Bras, Johan C. M.; and Gabelli, Antonio, to SKF Industrial Trading & Development Company B.V. Seal for a rolling bearing unit. 4,545,692, Cl. 384-477.000.

Brasquies, Alain: *See—*
Delarche, Hubert; Brasquies, Alain; and Maures, Michel, 4,546,175, Cl. 536-35.000.

Braun Aktiengesellschaft: *See—*
Schwarz, Gerhard, 4,546,304, Cl. 323-287.000.

Bray, David. Method of manufacturing adhesive tape. 4,545,843, Cl. 156-322.000.

Bredemann, Peter: *See—*
Mahrus, Duraid; and Bredemann, Peter, 4,545,913, Cl. 252-12.600.

Breitenfellner, Franz; and Kainmulle, Thomas, to Ciba Geigy Corporation. Flame-retarding, reinforced moulding material based on thermoplastic polyesters and the use thereof. 4,546,126, Cl. 523-216.000.

Breitholtz, Claes, to Dynapac Maskin AB. Procedure and device for optimation of the vibration amplitude in vibratory rollers. 4,546,425, Cl. 364-153.000.

Brems, John H. Straight line linkage. 4,545,266, Cl. 74-103.000.

Brenden, Bryon B.; and Russell, James T., to Digital Recording Corporation. Focusing elements and system for producing a prescribed energy distribution along an axial focal zone. 4,545,653, Cl. 350-432.000.

Brescia, Riccardo; Manini, Enrico; Balbo, Edoardo; and Scardovi, Alessandro, to Ing. C. Olivetti & C., S.p.A. Ink jet printing method and device. 4,546,361, Cl. 346-140.00R.
Bridges, Jack E.; and Taflove, Allen, to IIT Research Institute. Conduction heating of hydrocarbonaceous formations. 4,545,435, Cl. 166-248.000.
Bridges, Robert B.: *See—*
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Bridges, Thomas J.: *See—*
Beni, Gerardo; Bridges, Thomas J.; Hackwood, Susan; and Lin, Chinlon, 4,545,713, Cl. 414-1.000.
Bridges, William B., to Hughes Aircraft Company. Method and apparatus for separating isotopes using electrophoresis in a discharge. 4,545,878, Cl. 204-157.10R.
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Itoh, Michio; Tsukamoto, Takehiro; Watanabe, Shuichi; Kinoshita, Takeshi; and Tomita, Seisuke, 4,545,416, Cl. 152-539.000.
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Briscoe, Peter F.: *See—*
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Brissonneau et Lotz Marine: *See—*
Lemaire, Marc; and Le Roc'h, Roland, 4,545,269, Cl. 81-57.340.
Bristol-Myers Company: *See—*
Algieri, Aldo A., 4,546,188, Cl. 546-194.000.
Konishi, Masataka; Sakai, Fumihide; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,546,084, Cl. 435-253.000.
British Gas Corporation: *See—*
Sheppard, Christine M.; Puxley, David C.; Banks, Reginald G. S.; and McKenzie, Donald, 4,546,091, Cl. 502-84.000.
British Nuclear Fuels Limited: *See—*
Gillies, George M.; Kennett, Leslie P.; and Mathews, Clive A., 4,545,764, Cl. 432-115.000.
Broadbent, Edward G., to Tautliner Inc. Van body with pleated sides. 4,545,611, Cl. 296-181.000.
Brocard, Didier: *See—*
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Brock, Clifford D., to CCMC, Inc. Method and apparatus for mounting facing pieces to a building structure. 4,545,167, Cl. 52-509.000.
Brockett, Bruce W.; and Miller, Robert E., to Appleton Papers Inc. Record member. 4,546,365, Cl. 346-214.000.
Brodeur, Rene H.; and Terlecky, Boris S. Articulated railroad car. 4,545,304, Cl. 105-3.000.
Brombach, Hansjorg: *See—*
Vischer, Daniel; and Volkart, Peter, 4,545,403, Cl. 137-497.000.
Bronstein-Bonte, Irena Y.; and Lindholm, Edward P., to Polaroid Corporation. Polymeric pH-sensitive optical filter agents and articles including same. 4,546,062, Cl. 430-215.000.
Brooks, Lionel H., to Carbomedics, Inc. Level control for a fluidized bed. 4,546,012, Cl. 427-213.000.
Brooks, Mark A.; Tomala, Ambrose; and Casey, Gary L., to Allied Corporation. Glow plug having a conductive film heater. 4,545,339, Cl. 123-145.00A.
Brooks, Paul S., to Bechtel International Corporation. Skewed T-fillet weld gauge. 4,545,124, Cl. 33-169.00D.
Brother Kogyo Kabushiki Kaisha: *See—*
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Broussely, Michel; and Lecerf, Andre , to Saft, S.A. Positive active material for electrochemical cells and electrochemical cells using said material. 4,546,057, Cl. 429-218.000.
Brown, Boveri & Cie AG: *See—*
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Brown, Henry C., to McDonnell Douglas Corporation. Piezoelectric valve operator. 4,545,561, Cl. 251-129.080.
Brown, J. Gale. Modular-accessible-tiles providing accessibility to conductors and piping with improved sound isolation. 4,546,024, Cl. 428-44.000.
Brown, Robert A.: *See—*
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Brown & Williamson Tobacco Corporation: *See—*
Johnson, Robert R., 4,545,391, Cl. 131-336.000.
Browning, Jess. Powder spray booth and interchangeable collectors. 4,545,324, Cl. 118-634.000.
Bruce, Robert A., to Metheus Corporation. Raster graphics display refresh memory architecture offering rapid access speed. 4,546,451, Cl. 364-900.000.
Bruce, Thomas W.: *See—*
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Bruere, Alain E.: *See—*
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Brun, Alain M.; Marcotte, Louis; and Mellul, Myriam, to L'Oreal. Cell for the measurement of the dielectric constant of viscous or pasty substances. 4,546,312, Cl. 324-61.00P.
Bruns, Klaus: *See—*
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Brunswick Corporation: *See—*
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Bryant, George E., to W. R. Grace & Co. Method of securing an insulation member to a wall or wall-stud assembly. 4,545,103, Cl. 29-432.000.
Buchanan, Bobby L. Polysilicon/silicon junction field effect transistors and integrated circuits (POSFET). 4,546,366, Cl. 357-22.000.
Buchanan, Bradley H. Heat cutting and sealing apparatus. 4,545,844, Cl. 156-515.000.
Buchberger, Harold W., to Curtis Industries. Electrical splicing connector. 4,545,640, Cl. 339-272.00R.
Budinski, Kenneth G.; and Brandon, Kenneth F., to Eastman Kodak Company. Optical disc assembly retaining rings. 4,546,465, Cl. 369-287.000.
Bufalini, Angelo J.; and Gaughan, Edmund J., to Stauffer Chemical Company. Herbicide compositions of extended soil life. 4,545,805, Cl. 71-87.000.
Buhlwe-Miag GmbH: *See—*
Amelung, Kurt; and Peters, Manfred, 4,545,137, Cl. 34-233.000.
Bui-Hai, Nhu, to Thomson CSF. Antenna with a polarization rotator in waveguide feed. 4,546,359, Cl. 343-781.00R.
Bui-Hai, Nhu, to Thomson CSF. Multiplexing device for grouping two frequency bands. 4,546,471, Cl. 370-123.000.
Buie, James L., to TRW Inc. Read-only memory construction and related method. 4,546,456, Cl. 365-227.000.
Buist, Kevin S.; and Kachnowski, Thomas A., to Burroughs Corporation. Terminal elevating mechanism. 4,545,556, Cl. 248-346.000.
Bulkowski, John E., to University of Delaware. Binucleating ligand-metal complexes as oxidation catalysts. 4,545,937, Cl. 260-396.00R.
Bullis, David C., to Du Pont de Nemours, E. I., and Company. Data compression interface having parallel memory architecture. 4,546,444, Cl. 364-550.000.
Bunnell, Edward D., to AMP Incorporated. Matrix connector. 4,545,635, Cl. 339-99.00R.
Burch, John. Method and apparatus for time based measurement of impedance. 4,546,441, Cl. 364-482.000.
Burke, Alun, to Rodyne Limited. Quarter turn actuators. 4,545,288, Cl. 92-5.00R.
Burkum, Merlin E.: *See—*
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Burlington Industries, Inc.: *See—*
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Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Injection lasers with quantum size effect transparent waveguiding. 4,546,480, Cl. 372-45.000.
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Osman, Fazil I., 4,546,273, Cl. 307-468.000.
Sellars, Graham P., 4,546,395, Cl. 360-77.000.
Busboom, Garry W., to Deutz-Allis Corporation. Bifolding shield for agricultural harvester. 4,545,719, Cl. 414-523.000.
Buschhoff, Karl; and Fischer, Heinrich, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Method for producing crowned tooth flanks on a toothed workpiece, and a machine suited therefor. 4,545,708, Cl. 409-49.000.
Buse, Frederic W., to Ingersoll-Rand Company. Molded seal gland with groove for cooling fluid. 4,545,585, Cl. 277-22.000.
Byers, Larry L.: *See—*
Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., 4,546,430, Cl. 364-200.000.
Byrd, James L. Ladder fastening device for pole climbing. 4,545,460, Cl. 182-107.000.
C. Delachaux: *See—*
Ruellan, Andre , 4,546,218, Cl. 191-40.000.
C. R. Bard, Inc.: *See—*
Leary, James J., 4,545,390, Cl. 128-772.000.
Cabeza, Maximino R. Ball race for bicycle headset. 4,545,594, Cl. 280-279.000.
Cabot, Richard C., to Tektronix, Inc. Sample and hold droop compensation circuit. 4,546,270, Cl. 307-353.000.
Cada, Frank E.: *See—*
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Cage, James K.; and Villena, Edgardo I., to Hunt-Wesson Foods, Inc. Method for making an extrusion blow molded no drip lip. 4,545,953, Cl. 264-533.000.
Caldwell, Stephen P.; and Pedersen, David R., to United States of America, Air Force. Narrow pulsewidth pulse generator circuit utilizing NPN microwave transistors. 4,546,268, Cl. 307-265.000.
Callejas, Ricardo J.: *See—*
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Calvert, Rodney K., to Mead Corporation, The. Apparatus for rotating a moving package having spaced generally parallel opposite sides. 4,545,476, Cl. 198-399.000.

Campbell, Bryant A.; and Miller, Nicholas E., to Anicon, Inc. Chemical vapor deposition apparatus. 4,545,327, Cl. 118-719.000.
Campbell, James B., Jr.; and Bare, Thomas M., to ICI Americas Inc. Pyrazolopyridine cycloalkanones and process for their preparation. 4,546,104, Cl. 514-293.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy and Natural Resources: *See*—
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Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources: *See*—
Wan, Jeffrey K. S.; and Kriz, Jaroslav F., 4,545,879, Cl. 204-158.00R.
Canadian Fram Limited: *See*—
Kearsley, Walter H.; and Wendt, David L., 4,545,357, Cl. 123-556.000.
Canadian Occidental Petroleum Ltd.: *See*—
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., 4,545,892, Cl. 208-11.0LE.
Canalizo, Carlos R.; and Hays, James M., to Otis Engineering Corporation. Method and apparatus for producing a well. 4,545,731, Cl. 417-86.000.
Cancio, Leopoldo V.; and Wu, Pai-Chuan, to Clopay Corporation. Random embossed matte plastic film. 4,546,029, Cl. 428-141.000.
Canivez, Etienne: *See*—
Lyskawa, Edmond; Roger, Paul; Marquis, Jean; and Canivez, Etienne, 4,545,860, Cl. 201-41.000.
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Fujiyama, Yasutomo; and Okabe, Shotaro, 4,545,328, Cl. 118-723.000.
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Masaki, Katsumi; and Tago, Toshifumi, 4,546,449, Cl. 364-900.000.
Saitoh, Keishi; and Ando, Wataru, 4,546,008, Cl. 427-38.000.
Sakai, Shinji; and Kawabata, Takashi, 4,545,664, Cl. 354-400.000.
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,545,881, Cl. 204-192.0SP.
Tokuume, Yoshihiro; and Sato, Hideaki, 4,546,392, Cl. 360-30.000.
Cantatore, Giuseppe, to Ciba-Geigy S.p.A. Polymeric compounds, containing piperidine radicals, a process for their preparation, and their use as stabilizers for synthetic polymers. 4,546,148, Cl. 525-186.000.
Caray, Andre , to Valeo. Torsion damping assemblies for clutch discs. 4,545,468, Cl. 192-106.200.
Caray, Andre , to Valeo. Clutch release bearing. 4,545,472, Cl. 192-98.000.
Carbomedics, Inc.: *See*—
Brooks, Lionel H., 4,546,012, Cl. 427-213.000.
Carbonneau Industries, Inc.: *See*—
Carbonneau, James T.; and Stahel, Paul, 4,546,277, Cl. 310-13.000.
Carbonneau, James T.; and Stahel, Paul, to Carbonneau Industries, Inc. Linear motor. 4,546,277, Cl. 310-13.000.
Carey, Bruce P.; and O'Toole, Richard M., to Integrated Ceilings Inc. Modular monolithic ceiling grid system. 4,545,165, Cl. 52-488.000.
Carl, Charles L.; Gale, Ronald S.; and Forstrom, William J., to Willamette Industries, Inc. Method for applying coupon packets to paper bags. 4,545,781, Cl. 493-220.000.
Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
Buschhoff, Karl; and Fischer, Heinrich, 4,545,708, Cl. 409-49.000.
Carl, Norman J., to Sanders Associates, Inc. Liquid toner applicator. 4,545,326, Cl. 118-660.000.
Carl-Zeiss-Stiftung: *See*—
Grimm, Wolfgang; and Schurle, Hermann, 4,545,678, Cl. 356-124.000.
Carluccio, John F. Cosmetic container. 4,545,696, Cl. 401-175.000.
Carr, Dennis D.; and Walton, Riley C., to Eagle-Picher Industries, Inc. Support assembly for cells of a secondary battery. 4,546,054, Cl. 429-101.000.
Carrier Corporation: *See*—
Lord, Richard G., 4,545,210, Cl. 62-77.000.
Cartwright, John S.; and Hurst, Jerry C., to AT&T Technologies, Inc. Method and apparatus for securing articles in place on a substrate. 4,545,761, Cl. 432-5.000.
Casamassima, Mario: *See*—
Guscott, John K.; and Casamassima, Mario, 4,546,344, Cl. 340-501.000.
Casey, Gary L., to Allied Corporation. Liquified petroleum gas carburetor. 4,545,356, Cl. 123-527.000.
Casey, Gary L.: *See*—
Brooks, Mark A.; Tomala, Ambrose; and Casey, Gary L., 4,545,339, Cl. 123-145.00A.
Cashin Systems Corp.: *See*—
Spooner, Robert J.; and Dillon, Oscar W., 4,545,447, Cl. 177-165.000.
Caterpillar Tractor Co.: *See*—
Moring, Rodger L.; and Rieke, Brent E., 4,545,452, Cl. 180-88.000.
Cavalli, Alfredo. Multi-purpose device incorporating a freezing cycle, more particularly for producing ice cream and similar frozen products. 4,545,216, Cl. 62-343.000.
CCMC, Inc.: *See*—
Brock, Clifford D., 4,545,167, Cl. 52-509.000.
Cedrone, Nicholas J.; and Lee, Kenneth R., to Daymarc Corporation. Storage unit for an integrated circuit tester. 4,546,404, Cl. 361-331.000.
Celanese Corporation: *See*—
Gajria, Chandrasen; and Ozari, Yehuda, 4,546,014, Cl. 427-239.000.
Celotex Corporation, The: *See*—
Frentzel, Richard L., 4,546,034, Cl. 428-318.400.
Century Mfg. Co.: *See*—
Smith, Leonard S., 4,546,302, Cl. 320-25.000.
CeramPhysics, Inc.: *See*—
Lawless, William N.; and Clark, C. Frederick, Jr., 4,545,254, Cl. 73-714.000.
Cervini, Carl: *See*—
Krosoczka, Joseph D.; and Cervini, Carl, 4,545,564, Cl. 251-315.000.
Cerwin, Robert J.; and Pedlick, John S., to Ethicon, Inc. Non-metallic, bio-compatible hemostatic clips (two piece configured to lock tighter the larger the vessel being closed). 4,545,377, Cl. 128-325.000.
Cessna Aircraft Company, The: *See*—
Jackson, Alan D., 4,545,287, Cl. 91-420.000.
Cetus Corporation: *See*—
Neidleman, Saul L.; and Geigert, John, 4,546,080, Cl. 435-148.000.
Chalaye, Jean Phillipe: *See*—
Kalopissis, Gregoire; Gallien, Jacqueline; Jacquet, Bernard; Bauer, Daniel; and Chalaye, Jean Phillipe, 4,545,978, Cl. 424-10.000.
Chalk, Christine D.; and Hayman, Cecil, to IC Gas International Limited. Heat storage materials. 4,545,916, Cl. 252-70.000.
Chalkley, Michael E.: *See*—
Weir, Donald R.; Masters, Ian M.; Doyle, Barry N.; and Chalkley, Michael E., 4,545,963, Cl. 423-26.000.
Chalono, Camille V. A. Apparatus for simultaneously taking several similar photographs. 4,545,662, Cl. 354-118.000.
Chambron, Edmond, to Thomson-CSF. Linearly displaceable examination table. 4,545,571, Cl. 269-322.000.
Champion International Corporation: *See*—
Lillibridge, Harold R.; and Russo, Joseph D., 4,545,846, Cl. 156-578.000.
Chan, David S. K., to Schlumberger Technology Corporation. Method and apparatus for measuring the depth of a tool in a borehole. 4,545,242, Cl. 73-152.000.
Chan, Robert H. G.; Mann, Martin R.; and Ciarrocchi, John A., to United States of America, Air Force. Interactive communication channel. 4,546,429, Cl. 364-200.000.
Chance, Buddy K.: *See*—
Muller, George H.; and Chance, Buddy K., 4,545,601, Cl. 280-668.000.
Chandler, Larry L.; Friar, Thurston R.; and Green, Berwyn W., to Foam Systems Company. Process for preparation of polyester polyols utilizing polyalkylene terephthalate. 4,546,169, Cl. 528-272.000.
Chang, Chen-Kun J. Coin counter trough. 4,545,394, Cl. 133-8.00R.
Chang, Eugene Y. C., to American Cyanamid Company. P-TMXDI Polyurethane elastomers with good compression set properties. 4,546,167, Cl. 528-64.000.
Chang, In-Kook: *See*—
Pyne, William J.; Lowbridge, John; Chang, In-Kook; Knotz, Florian; and Powers, Larry J., 4,545,810, Cl. 71-92.000.
Chang, Kong R.; and Lin, Trong G., to China Petrochemical Development Corp. Preparation of catalyst system for the synthesis of 2-6-xylenol. 4,546,093, Cl. 502-324.000.
Charkey, Allen; and Januszkiewicz, Stanley, to Energy Research Corporation. Nickel electrode for alkaline batteries. 4,546,058, Cl. 429-223.000.
Charlton Associates: *See*—
Miller, David A.; Krueger, Leland R.; and Charlton, Richard J., 4,545,153, Cl. 51-118.000.
Charlton, Richard J.: *See*—
Miller, David A.; Krueger, Leland R.; and Charlton, Richard J., 4,545,153, Cl. 51-118.000.
Charte, Vincent J.: *See*—
Gradeff, Peter S.; Charte, Vincent J.; Schreiber, Fred G.; and Davison, John F., 4,545,923, Cl. 252-309.000.
Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Electrical continuimeter. 4,546,310, Cl. 324-52.000.
Chen, James M.: *See*—
Schindler, Harvey D.; and Chen, James M., 4,545,890, Cl. 208-8.0LE.
Chen, Thomas Y.: *See*—
Gibson, Walter G.; Plotnick, Michael A.; and Chen, Thomas Y., 4,546,389, Cl. 358-342.000.
Cheney, Marvin C., Jr. Wind turbine generator with improved operating subassemblies. 4,545,728, Cl. 416-11.000.
Cheng, Huey-Der: *See*—
Hsiao, Yu-Sheng; and Cheng, Huey-Der, 4,545,490, Cl. 211-191.000.
Chern, Mao-Jin; Smith, Ronald T.; and Peters, John W., to Hughes Aircraft Company. Process for forming a graded index optical material and structures formed thereby. 4,545,646, Cl. 350-162.200.
Chevron Research Company: *See*—
Sweeney, William A., 4,545,855, Cl. 162-158.000.
Sweeney, William A., 4,545,856, Cl. 162-158.000.
Chiang, Hsing-Hui, to Asian Star, U.S.A., Inc. Method for making a hat. 4,545,313, Cl. 112-263.100.
Chikatani, Hajime, to Kabushiki Kaisha Daisei Kikai. Binding apparatus for packing. 4,545,185, Cl. 53-583.000.
China Petrochemical Development Corp.: *See*—
Chang, Kong R.; and Lin, Trong G., 4,546,093, Cl. 502-324.000.
Chisholm, Thomas, to U.S. Philips Corporation. Charged particle beam apparatus. 4,546,258, Cl. 250-396.00R.

Cho, Frederick Y.: *See—*
Adamo, Michael D.; Darter, Cederick U.; and Cho, Frederick Y., 4,546,283, Cl. 310-313.00R.

Chodorow, Marvin: *See—*
Shaw, Herbert J.; and Chodorow, Marvin, 4,546,476, Cl. 372-6.000.

Chou, Eddie C. J.; and Cooperrider, Mark W., to AMAX Inc. Production of cobalt and nickel powder. 4,545,814, Cl. 75-0.5AA.

Chow, Edmund E.: *See—*
Mueller, Richard J.; and Chow, Edmund E., 4,545,505, Cl. 222-65.000.

Christmann, Burkhard; Weber, Jorg; and Stadtfeld, Gerhard, to Licentia Patent-Verwaltungs-GmbH; and Mannesmann Aktiengesellschaft. Apparatus for determining mold wall wear during casting and for determining shrinkage of the casting from the inner wall of the mold. 4,545,420, Cl. 164-150.000.

Christmas, Walter P.; and Sanders, Bruce W., to AT&T Bell Laboratories. Switching network control circuit. 4,546,468, Cl. 370-54.000.

Christopher, Chris J.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.

Christoudias, George C. Silastic tube relay rod. 4,545,373, Cl. 128-303.00R.

Chrones, Anthony, to Gerber Products Company. Baby pacifier. 4,545,378, Cl. 128-360.000.

Chung, Dennis E.: *See—*
Chung, Yun H.; and Chung, Dennis E., 4,545,180, Cl. 53-456.000.

Chung, Yun H.; and Chung, Dennis E., to MPR Corporation. Method and apparatus for making and filling packets with a product. 4,545,180, Cl. 53-456.000.

Chupp, Vernon L., to Becton, Dickinson and Company. Prismatic beam expander for light beam shaping in a flow cytometry apparatus. 4,545,677, Cl. 356-39.000.

Ciarrocchi, John A.: *See—*
Chan, Robert H. G.; Mann, Martin R.; and Ciarrocchi, John A., 4,546,429, Cl. 364-200.000.

Ciba-Geigy AG: *See—*
Blake, Colin C.; and Bacon, Paul A., 4,545,873, Cl. 204-109.000.
Libicky, Arnost; and Schar, Meinrad, 4,546,069, Cl. 430-390.000.

Ciba-Geigy Corporation: *See—*
Abel, Heinz, 4,545,919, Cl. 252-174.180.
Breitenfellner, Franz; and Kainmulle, Thomas, 4,546,126, Cl. 523-216.000.
Hubele, Adolf; and Riebli, Peter, 4,546,109, Cl. 514-493.000.
Irving, Edward; and Smith, Terence J., 4,546,067, Cl. 430-325.000.
Meyer, Willy; and Fory, Werner, 4,545,811, Cl. 71-93.000.
Nyfeler, Robert, 4,546,099, Cl. 514-212.000.
Seiler, Herbert, 4,545,785, Cl. 8-549.000.

Ciba-Geigy S.p.A.: *See—*
Cantatore, Giuseppe, 4,546,148, Cl. 525-186.000.

Cielo, Paolo G.; and McMahon, Garfield W. Frequency modulated laser diode. 4,546,458, Cl. 367-149.000.

Ciszewski, Hans-Joachim; Pabst, Josef; and Weisser, Hans-Joerg, to Siemens Aktiengesellschaft. Method and apparatus for disinfecting waterlines of a medical device. 4,545,956, Cl. 422-28.000.

Citizen Watch Co., Ltd.: *See—*
Nakata, Toshikazu; and Toida, Takashi, 4,546,376, Cl. 357-23.700.

Clark, C. Frederick, Jr.: *See—*
Lawless, William N.; and Clark, C. Frederick, Jr., 4,545,254, Cl. 73-714.000.

Clark, Keith H., to United States of America, National Aeronautics and Space Administration. Apparatus for adapting an end effector device remotely controlled manipulator arm. 4,545,723, Cl. 414-730.000.

Clark, Steven G.: *See—*
Miller, Gregory R.; and Clark, Steven G., 4,545,790, Cl. 55-161.000.

Clifford, David L.: *See—*
Shulman, Joseph; and Clifford, David L., 4,545,648, Cl. 350-337.000.

Cline, Albert L., to Aspen Laboratories, Inc. Electrosurgical instrument. 4,545,375, Cl. 128-303.140.

Clopay Corporation: *See—*
Cancio, Leopoldo V.; and Wu, Pai-Chuan, 4,546,029, Cl. 428-141.000.

Cmapo-Garraza, Pedro: *See—*
Jourde, Jean-Pierre; Cmapo-Garraza, Pedro; Miettaux, Marc; and Michaux, Thierry, 4,545,352, Cl. 123-447.000.

Coal Industry (Patents) Limited: *See—*
Sharp, John, 4,545,621, Cl. 299-12.000.

Cochran, Gary L.; and Baum, Dean O., to J. I. Case Company. Quick coupler assembly. 4,545,720, Cl. 414-723.000.

Coetzer, Johan; Galloway, Roy C.; Bones, Roger J.; Teagle, David A.; and Moseley, Patrick T., to Lilliwyte Societe Anonyme. Electrochemical cell. 4,546,055, Cl. 429-103.000.

Cogan, Howard F.: *See—*
Washbourn, Jack; and Cogan, Howard F., 4,546,296, Cl. 318-372.000.
Washbourn, Jack; and Cogan, Howard F., 4,546,297, Cl. 318-372.000.
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., 4,546,295, Cl. 318-372.000.
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., 4,546,298, Cl. 318-372.000.

Colatsky, Thomas J.: *See—*
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Cole, James E.: *See—*
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Coleman, Edwin B.: *See—*
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,545,196, Cl. 60-39.230.

Collins, Anthony J., to B & P Barnett Limited. Crossbow. 4,545,358, Cl. 124-88.000.

Collins, Floyd K.; Hovey, Frederick A.; and Maninger, Loren L., to North American Philips Consumer Electronics Corp. Cathode ray tube focusing electrode shielding means. 4,546,287, Cl. 313-414.000.

Collins, Harry F., to Service Ideas, Inc. Wall-mountable single cup electric liquid heating appliance. 4,546,237, Cl. 219-331.000.

Collins, John W., to Mobil Oil Corporation. Reversing turbulators for heat exchangers. 4,545,426, Cl. 165-95.000.

Columbia Chemical Corporation: *See—*
Rosenberg, William E., 4,545,870, Cl. 204-54.00R.

Colvin, Harry, to Shanni International, Inc. Prefabricated folding structure. 4,545,171, Cl. 52-79.500.

Comarme, S.p.A.: *See—*
Marchetti, Augusto, 4,545,176, Cl. 53-76.000.

Combustion Engineering, Inc.: *See—*
Benton, Thomas K.; and Seay, James R., 4,545,260, Cl. 73-861.650.
Howard, Guy D.; and Bosso, Alexander, 4,545,305, Cl. 110-165.00R.
Zaterka, Theodore R., 4,545,308, Cl. 110-297.000.

Commissariat a l'Energie Atomique: *See—*
Bergez, Pierre; Deguelte, Alain; and Seigneurin, Laurent, 4,545,964, Cl. 423-138.000.

Commonwealth Edison Company: *See—*
Kang, Chang E.; Lowry, L. Alan; and Burkum, Merlin E., 4,546,309, Cl. 324-52.000.

Commonwealth of Australia, The: *See—*
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Compagnie d'Informatique Militaire Spatiale & Aeronautique: *See—*
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Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Favrel, Jean-Paul; Ouss, Jean; and Pocheau, Jean-Marc, 4,546,469, Cl. 370-77.000.

Compmail Systems, Inc.: *See—*
Parthasarathi, Thiruvenkata R., 4,545,178, Cl. 53-435.000.

Comtois, Raoul. Furnace for burning flammable particles. 4,545,309, Cl. 110-300.000.

Condair AG: *See—*
Huttlin, Herbert, 4,545,792, Cl. 55-241.000.

Congdon, John C., to Magnavox Government and Industrial Electronics Company. Method and apparatus for a phased array transducer. 4,546,459, Cl. 367-155.000.

Connelly, Joseph A.: *See—*
Pena-Finol, Jesus S.; and Connelly, Joseph A., 4,546,275, Cl. 307-498.000.

Connelly, Lawrence J.; and Selvarajan, Radhakrishnan, to Nalco Chemical Company. Flocculants for bauxite (red mud). 4,545,902, Cl. 210-734.000.

Connolly, Walter L.; and Ray, Harold T., to Grove Valve & Regulator Company. Method of manufacturing a weld neck flange. 4,545,231, Cl. 72-335.000.

Continental Industries, Inc.: *See—*
Mihojevich, Steven, 4,545,225, Cl. 70-71.000.

Control Data Corporation: *See—*
Johnson, Gerald H., 4,546,269, Cl. 307-269.000.

Conveyor Sales & Mfg. Co.: *See—*
Besch, Creighton J., 4,545,477, Cl. 198-841.000.

Cook, John; Tate, Harold, Jr.; and Graves, J. W. Antitheft device for vehicles. 4,545,343, Cl. 123-198.00B.

Cool Water Coal Gasification Program: *See—*
Covell, Russell B.; and Kwasnik, Andrew F., 4,545,330, Cl. 122-392.000.

Cooley, Julian B.: *See—*
Olson, Paul B.; Minday, Richard M.; and Cooley, Julian B., 4,546,090, Cl. 502-69.000.

Cooper, Ellis; and Lindahl, Gerald, to Barbosa, Joseph A. Electronic controller. 4,546,245, Cl. 250-211.00K.

Cooperrider, Mark W.: *See—*
Chou, Eddie C. J.; and Cooperrider, Mark W., 4,545,814, Cl. 75-0.5AA.

Cooray, Boyd, to Akzo N.V. Organotin-containing composition for the stabilization of polymers of vinyl chloride. 4,546,136, Cl. 524-180.000.

Cope, Carroll W., to DG Shelter Products. Molding coating composition and process. 4,546,133, Cl. 524-15.000.

Corboy, John F., Jr.: *See—*
Blackstone, Scott C.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,546,375, Cl. 357-23.400.

Cordis Corporation: *See—*
Bournay, Frederick M., Jr.; and Giurtino, Joel F., 4,545,381, Cl. 128-419.00P.
Schroeppel, Edward A., 4,545,380, Cl. 128-419.00P.
Tucci, Charles A., 4,545,367, Cl. 128-1.00R.

Corey, John A.; and Walsh, Michael M., to Mechanical Technology Incorporated. Means and method of balancing multi-cylinder reciprocating machines. 4,545,341, Cl. 123-192.00B.

Corning Glass Works: *See—*
Wusirika, Raja R., 4,546,089, Cl. 501-96.000.

Corsette, Douglas F. Designer's triangle. 4,545,130, Cl. 33-474.000.

Cosco, Inc.: *See—*
Martel, Lisa; Knoedler, Roy E.; and Gerken, Donald L., 4,545,613, Cl. 297-250.000.
Cosentino, Cesare C.: *See—*
Madonia, Ciro; Hatzikelis, Christopher; and Cosentino, Cesare C., 4,546,022, Cl. 428-31.000.
Councilman, Richard R., to Brunswick Corporation. Drag for spinning reels. 4,545,545, Cl. 242-84.50R.
Coursolle, Thomas P., to Rosemount Inc. Circuit with adjustable amplitude and rolloff frequency characteristics. 4,545,258, Cl. 73-861.220.
Couwenberg, Winston D.: *See—*
Heuvelmans, Jean J.; Couwenberg, Winston D.; and Ligthart, Franciscus A. S., 4,546,285, Cl. 313-25.000.
Covell, Russell B.; and Kwasnik, Andrew F., to Cool Water Coal Gasification Program. Self-cleaning liner. 4,545,330, Cl. 122-392.000.
Covington, Wayne F.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.
Cowen, Steven J.: *See—*
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Cox, Roger F.: *See—*
Gagon, Paul R.; and Cox, Roger F., 4,545,278, Cl. 84-1.150.
Crabbe, David K.: *See—*
Latino, Richard M.; and Crabbe, David K., 4,545,554, Cl. 248-118.100.
Craig, Glenn D., to United States of America, National Aeronautics and Space Administration. Wide dynamic range video camera. 4,546,248, Cl. 250-225.000.
Crawford, James A., Jr.: *See—*
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Creagh, Linda T.: *See—*
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Creative Products Resource Associates Ltd.: *See—*
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Crepps, Dewitt C.: *See—*
Sensabaugh, Andrew J., Jr.; Crepps, Dewitt C.; Rice, William Y., Jr.; and Fearrington, George W., Jr., 4,545,392, Cl. 131-352.000.
Cribb, B. Jay, Jr.; Drozd, Edward J., Jr.; Wilmot, Ian R.; and Leap, Debradell C., to Kraft, Inc. Plastic closure for grated cheese or the like. 4,545,508, Cl. 222-153.000.
Croley, Donald F.: *See—*
Bartlett, John C.; Bohnhoff, Alan E.; Croley, Donald F.; Dyer, Stanley; Edds, Kenneth E.; Horlander, Frank J.; and Stafford, Donald W., 4,545,693, Cl. 400-120.000.
Cros, Yves: *See—*
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Crosby, E. Eugene, to Owens-Corning Fiberglas Corporation. Spinner device for rotary production of fibers. 4,545,796, Cl. 65-15.000.
Crossley, Roger; and Dickinson, Kay H., to John Wyeth & Brother Limited. Piperidinoalkylthio pyridinium compounds. 4,546,187, Cl. 546-193.000.
Crowder, Inc.: *See—*
Crowder, Jack L., Sr., 4,546,212, Cl. 179-2.00C.
Crowder, Jack L., Sr., to Crowder, Inc. Data/voice adapter for telephone network. 4,546,212, Cl. 179-2.00C.
Crudele, Richard E., to Powered Platforms Mfg. Platform suspending davit mounting apparatus and method. 4,545,558, Cl. 248-544.000.
Crutcher, W. Larkin, to Reliance Electric Company. Adaptable demodulator for arbitrary amplitude and phase keyed modulation signals. 4,546,322, Cl. 329-50.000.
CTBA Associates: *See—*
McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, 4,546,382, Cl. 358-84.000.
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Curatolo, Joseph A., Jr.: *See—*
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Curletto, Giorgio F. Electronic accordion housing and support stand. 4,545,276, Cl. 84-1.010.
Curran, Patrick A., to Texas Instruments Incorporated. Monolithic integration of logic, control and high voltage interface circuitry. 4,546,370, Cl. 357-43.000.
Curtin, Daniel J., to Atlantic Richfield Company. Process for the recovery of a mineral. 4,545,620, Cl. 299-4.000.
Curtis Industries: *See—*
Buchberger, Harold W., 4,545,640, Cl. 339-272.00R.
Cutkosky, Mark R.; and Kurokawa, Eiki, to Westinghouse Electric Corp. Flexible robot gripper for irregular shapes. 4,545,722, Cl. 414-730.000.
Cyclonaire Corporation: *See—*
Paul, Kermit D.; Addams, Charles F., Jr.; and Wuertele, Frederick S., 4,545,410, Cl. 141-18.000.
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., to Alberta Energy Company Ltd.; Canadian Occidental Petroleum Ltd.; Esso Resources Canada Limited; Gulf Canada Limited; Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy and Natural Resources; HBOG-Oil Sands Limited; Pan Canadian Petroleum Limited; and Petro-Canada Inc. Treatment of primary tailings and middlings from the hot water extraction process for recovering bitumen from tar sand. 4,545,892, Cl. 208-11.0LE.
Cymerman, George J.: *See—*
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., 4,545,892, Cl. 208-11.0LE.
Dackow, Paul N., to RCA Corporation. Auto ranging counter. 4,546,487, Cl. 377-51.000.
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Hanamoto, Keiji; and Takagi, Fumio, 4,545,752, Cl. 425-112.000.
Daifuku Co., Ltd.: *See—*
Fujita, Shigeyoshi; Kiuchi, Naoyuki; Sasaki, Tomoyuki; and Fukuhara, Kazuyoshi, 4,545,303, Cl. 104-93.000.
Daikin Kogyo Co., Ltd.: *See—*
Nakagawa, Tsuneo; Yamaguchi, Sadatsu; Amano, Toshihiko; and Asano, Kohzoh, 4,546,157, Cl. 526-247.000.
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,545,428, Cl. 165-110.000.
Daimler-Benz Aktiengesellschaft: *See—*
Hafner, Gunther; Noreikat, Karl-Ernst; Schmidt, Hans-Dieter; Letsche, Ulrich; and Bauer, Bernhard, 4,546,426, Cl. 364-153.000.
Dainippon Pharmaceutical Co., Ltd.: *See—*
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, 4,545,932, Cl. 260-112.50R.
Dalton, Robert F., Jr., to Alma Desk Company. Interconnecting wall panels. 4,545,168, Cl. 52-588.000.
Dana Corporation: *See—*
Guenther, William D., 4,546,048, Cl. 428-608.000.
Danelson, Terry L.; and Harmon, Barry J. Drive assembly. 4,545,471, Cl. 192-67.00R.
Danfoss A/S: *See—*
Jensen, Hans-Erik K.; Abildgaard, Niels; and Nielsen, Steen H., 4,545,259, Cl. 73-861.280.
Daniel, Winfield C.; and Sitterding, Richard K., to Burlington Industries, Inc. Adjustment and cleaning of the venturi gap in a dyeing machine. 4,545,221, Cl. 68-181.00R.
Danneels, Laurent: *See—*
Vanhumbeeck, Jacky; Danneels, Laurent; De Steur, Hubert; and Heyneman, Guido, 4,545.957, Cl. 422-81.000.
d'Aragona, F. Secco, to Motorola Inc. Method for control of oxygen in silicon crystals. 4,545,849, Cl. 156-617.0SP.
Darter, Cederick U.: *See—*
Adamo, Michael D.; Darter, Cederick U.; and Cho, Frederick Y., 4,546,283, Cl. 310-313.00R.
DaSilva, Marcus K.; Whipple, David P.; and Temple, Robert E., to Hewlett-Packard Company. Frequency modulation in a phase-locked loop. 4,546,331, Cl. 332-19.000.
David L. Durfee, Jr.: *See—*
Durfee, David L., Jr., 4,545,122, Cl. 30-383.000.
Davis, Burns: *See—*
Barbee, Robert B.; and Davis, Burns, 4,546,170, Cl. 528-302.000.
Davis, William H., to Ring Around Products, Inc. Route to hybrid soybean production. 4,545,146, Cl. 47-58.000.
Davison, John F.: *See—*
Gradeff, Peter S.; Charte, Vincent J.; Schreiber, Fred G.; and Davison, John F., 4,545,923, Cl. 252-309.000.
Dawson, Glenn W.; Griffiths, David C.; and Pickett, John A., to National Research Development Corporation. Pheromones. 4,546,110, Cl. 514-529.000.
Day, James L., to Ohio Medical Instrument Company, Inc. Apparatus for holding the head of a patient for surgery. 4,545,572, Cl. 269-328.000.
Day Star Concepts: *See—*
Lakes, Sherman, 4,546,134, Cl. 524-141.000.
Day, Timothy T., to W. R. Grace & Co., Cryovac Div. Packing process and apparatus. 4,545,177, Cl. 53-434.000.
Daymarc Corporation: *See—*
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,546,404, Cl. 361-331.000.
Dayus, Lloyd G. Frictional blade assembly for grille. 4,545,294, Cl. 98-110.000.
DBS, Inc.: *See—*
DeLorenzo, Dana, 4,545,302, Cl. 101-269.000.
DeBeradinis, Louis A.: *See—*
Baggio, Horacio; Eckart, George R.; and DeBeradinis, Louis A., 4,546,418, Cl. 362-85.000.
Deere & Company: *See—*
Viaud, Jean, 4,545,298, Cl. 100-88.000.
Wilson, Lance K., 4,546,087, Cl. 436-5.000.
DeFord, Daniel. Garbage can lid retainer. 4,545,501, Cl. 220-318.000.
Degelaen, Jacques; Loffet, Albert; and Durieux, Jean-Pierre, to U C B Societe Anonyme. Enzymatic process for the determination of beta-lactam antibiotics. 4,546,076, Cl. 435-24.000.
Deguelte, Alain: *See—*
Bergez, Pierre; Deguelte, Alain; and Seigneurin, Laurent, 4,545,964, Cl. 423-138.000.
de Haan, Friedrich J., administrator: *See—*
Goddijn, Bernardus H. A., deceased; and de Haan, Friedrich J., administrator, 4,546,305, Cl. 323-299.000.
Deininger, Horst; and Stuermer, Burkhard, to Linde Aktiengesellschaft. Hydrostatic drive units. 4,545,203, Cl. 60-468.000.
Delarche, Hubert; Brasquies, Alain; and Maures, Michel, to Societe Nationale des Poudres et Explosifs. Process for the manufacture of reels of nitrocellulose thread. 4,546,175, Cl. 536-35.000.

Delgrange, Louis, to Thomson-CSF. Process for establishing control signals for an alternating plasma panel. 4,546,289, Cl. 315-169.400.

DeLorenzo, Dana, to DBS, Inc. Validator/imprinter apparatus. 4,545,302, Cl. 101-269.000.

Del Val, Sagrario M.: *See*—
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Denison, Early B., to Shell Offshore Inc. Drilling riser locking apparatus and method. 4,545,437, Cl. 166-345.000.

Denisov, Roman A.; Tiit, Valdur M.; and Feldbakh, Eduard K., to Institut Fiziki Akademii Nauk Estonskoi SSR. Spectrophotometer for measuring transmission spectra. 4,546,256, Cl. 250-372.000.

de Nora, Vittorio; and Beer, Henri B., to ELTECH Systems Corporation. Narrow gap electrolysis cells. 4,545,886, Cl. 204-252.000.

Dentsply Research & Development Corp.: *See*—
Gonser, Donald I.; Eden, George T.; and Tateosian, Louis H., 4,546,261, Cl. 250-492.100.

Deriso, Cheryl: *See*—
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Desautels, S. Jerry: *See*—
Platek, Stanley W.; Desautels, S. Jerry; and Szczypiorski, Wojtek, 4,545,423, Cl. 164-481.000.

deSouza, Alwyn A.; and Eggendorfer, Andreas J., to Joslyn Mfg. and Supply Co. Hermetically sealed gas tube surge arrester. 4,546,402, Cl. 361-120.000.

De Steur, Hubert: *See*—
Vanhumbeeck, Jacky; Danneels, Laurent; De Steur, Hubert; and Heyneman, Guido, 4,545,957, Cl. 422-81.000.

Dettmer, Michael: *See*—
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Deutsche Babcock Werke Aktiengesellschaft: *See*—
Beelmann, Richard; and Kerstges, Johannes, 4,545,727, Cl. 415-206.000.
Gladisch, Manfred; and Winklmann, Erwin, 4,546,281, Cl. 310-83.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See*—
Schroder, Gunter; and Kiehne, Joachim, 4,545,569, Cl. 269-43.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Neier, Wilhelm; Webers, Werner; and Dettmer, Michael, 4,546,206, Cl. 568-697.000.

Deutz-Allis Corporation: *See*—
Busboom, Garry W., 4,545,719, Cl. 414-523.000.

DeVeau, George F., Jr.; and Miller, Calvin M., to AT&T Bell Laboratories. Optical fiber connector and articles connected therewith. 4,545,644, Cl. 350-96.210.

Devine, John W., Jr.: *See*—
Nestor, Jack; and Devine, John W., Jr., 4,545,081, Cl. 623-11.000.

De Vries, Jochem J., to U.S. Philips Corporation. Shaving apparatus. 4,545,120, Cl. 30-34.200.

De Waele, Gerard, to Hanota Holdings SA. Method for adjusting in the height building blocks and similar. 4,545,948, Cl. 264-162.000.

Dewey, George G., to Illinois Tool Works Inc. Device for assuring predetermined joint loading in roof insulation assemblies. 4,545,270, Cl. 81-429.000.

Dewyer, Milo. Adaptor for connecting a grease gun to flexible drive cables for lubrication purposes. 4,545,461, Cl. 184-15.100.

DG Shelter Products: *See*—
Cope, Carroll W., 4,546,133, Cl. 524-15.000.

Dhein, Rolf: *See*—
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,546,138, Cl. 524-326.000.

Dick, William J. Modem security device. 4,546,213, Cl. 179-2.00A.

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Dickson, James. Can for containing material for consolidation into widgets and method of using the same. 4,545,955, Cl. 419-38.000.

Didier-Werke AG: *See*—
Rothfuss, Hans; Wieland, Gunter; and Schreiter, Peter, 4,545,568, Cl. 266-280.000.

DiDomenico, Edward: *See*—
Peerman, Dwight E.; DiDomenico, Edward; Frisch, Kurt C.; and Meffert, Alfred, 4,546,120, Cl. 521-159.000.

Diekotter, Friedrich W.; Honges, Edgar; Just, Gunther; Smolka, Heinz-Gerd; and Wust, Willi, to Henkel KGaA. Process for dewatering zeolite suspensions. 4,545,969, Cl. 423-328.000.

Dienes, Zoltan B.; and Mineur, Thomas L., to Thomas & Betts Corporation. Method of sealing pressurized electrical cable while under pressure. 4,545,830, Cl. 156-48.000.

DiGiovacchino, David J.: *See*—
Leshik, Richard R.; Swallow, Nancy A.; Leusner, Steven J.; and DiGiovacchino, David J., 4,546,002, Cl. 426-576.000.

Digital Recording Corporation: *See*—
Brenden, Bryon B.; and Russell, James T., 4,545,653, Cl. 350-432.000.

Digital Recording Research Limited Partnership: *See*—
Weaver, Charles S.; LeBlanc, Robert A.; and Sweeney, Lawrence E., Jr., 4,546,342, Cl. 340-347.0DD.

Dilling, Peter, to Westvaco Corporation. Selective crosslinking of low molecular weight sulfonated lignins and lignosulfate products produced thereby. 4,546,173, Cl. 530-501.000.

Dillon, Oscar W.: *See*—
Spooner, Robert J.; and Dillon, Oscar W., 4,545,447, Cl. 177-165.000.

Dion, Eric P., to Mobil Oil Corporation. Method for monitoring potassium chloride concentration in drilling fluids. 4,546,252, Cl. 250-252.100.

Disco Co., Ltd.: *See*—
Sekiya, Shinji; and Ono, Takatoshi, 4,545,154, Cl. 51-209.00R.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
Schreiner, Hermann, 4,545,340, Cl. 123-146.50A.

Dodd, John R., to Henry Mann, Inc. Apparatus for facilitating the movement of a plurality of containers. 4,545,608, Cl. 294-87.100.

Donges, William E., to Nordson Corporation. Plug-in circuit board connector and keying assembly. 4,546,414, Cl. 361-413.000.

Donlan, John F.: *See*—
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Donn Incorporated: *See*—
Shirey, Richard, 4,545,170, Cl. 52-670.000.

Donner, Meinrad: *See*—
Bloch, Peter; Donner, Meinrad; and Schwaighofer, Roman, 4,545,151, Cl. 51-52.00R.

Dooley, Jimmy B., to Babcock & Wilcox Company, The. Tool using replaceable bits. 4,545,711, Cl. 408-197.000.

Dopatka, Hans-Detlef, to Behringwerke Aktiengesellschaft. Microtitration plate. 4,545,958, Cl. 422-102.000.

Dorn, Conrad P.: *See*—
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Dow Chemical Company, The: *See*—
Arndt, Kim E.; Rogers, Richard B.; and McCormick, Ronald W., 4,545,803, Cl. 71-27.000.
Au, Andrew T., 4,546,189, Cl. 546-300.000.
Fujioka, George S.; and Fung, Alexander P., 4,546,192, Cl. 546-345.000.
Hefner, Robert E., Jr., 4,546,129, Cl. 523-456.000.
Hefner, Robert E., Jr., 4,546,131, Cl. 523-466.000.
McCormick, Ronald W.; and Rogers, Richard B., 4,545,802, Cl. 71-27.000.

Dow Corning Corporation: *See*—
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Dow Corning Ltd.: *See*—
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Flackett, Dale R.; Jonas, Reinhard; and Trego, Brian R., 4,546,017, Cl. 427-387.000.

Doyle, Barry N.: *See*—
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Dresser Industries, Inc.: *See*—
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Marcadet, Luc; and Ozanne, Michel, 4,545,560, Cl. 251-58.000.

Drexler, Joannes H.; and Peters, Wolfram J. P. Safety autocar chair for children. 4,545,617, Cl. 297-340.000.

Drive Line Service, Inc.: *See*—
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Drower, Herbert M.: *See*—
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Drowley, Clifford I., to Hewlett-Packard Company. Grain boundary confinement in silicon-on-insulator films. 4,545,823, Cl. 148-1.500.

Drozd, Edward J., Jr.: *See*—
Cribb, B. Jay, Jr.; Drozd, Edward J., Jr.; Wilmot, Ian R.; and Leap, Debradell C., 4,545,508, Cl. 222-153.000.

Dubois, Jean-Claude; Ravaux, Gilles; and Le Barny, Pierre, to Thomson-CSF. Liquid crystals having a type A smectic phase. 4,545,921, Cl. 252-299.620.

Dudash, Carl S., to United Technologies Corporation. Jam compensating control valve. 4,545,407, Cl. 137-596.000.

Dunavin, Timothy E.; and Scarantino, Michael A., to Harper-Wyman Company. Thermostat calibration apparatus. 4,545,689, Cl. 374-1.000.

Dunham-Bush, Inc.: *See*—
Schaefer, Donald D., 4,545,742, Cl. 417-366.000.

Dunwald, Willi: *See*—
Zecher, Wilfried; Dunwald, Willi; Merten, Rudolf; and Reinking, Klaus, 4,546,162, Cl. 528-67.000.

Du Pont de Nemours, E. I., and Company: *See*—
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Bullis, David C., 4,546,444, Cl. 364-550.000.
Knight, Alan C., 4,546,144, Cl. 524-546.000.
Kunz, Robert A., 4,546,179, Cl. 544-206.000.
Levitt, George, 4,545,808, Cl. 71-92.000.
Matrick, Howard, 4,546,072, Cl. 430-449.000.
Neidich, Douglas A., 4,545,638, Cl. 339-205.000.

Dupuis, Gilles: *See*—
Miller-Thomson, James J.; and Dupuis, Gilles, 4,546,490, Cl. 381-56.000.

DuPuy, Richard E., Jr.: *See—*
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Durfee, David L., Jr., to David L. Durfee, Jr. Chain saw gauging attachment. 4,545,122, Cl. 30-383.000.

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Duval Corporation: *See—*
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Dziekan, Dennis J.: *See—*
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E. Reichert Optische Werke AG: *See—*
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Eagle-Picher Industries, Inc.: *See—*
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Earley, Robert W., to White Consolidated Industries, Inc. Oil stirrer for refrigeration compressor. 4,545,743, Cl. 417-372.000.

Eastman Kodak Company: *See—*
Anderson, Clifford L., 4,545,671, Cl. 355-3.0SH.
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Budinski, Kenneth G.; and Brandon, Kenneth F., 4,546,465, Cl. 369-287.000.
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Eaton Corporation: *See—*
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Petrie, Dennis J.; Bridges, Robert B.; Grass, William E.; and Hastings, Jerome K., 4,546,337, Cl. 335-16.000.
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Ebara Corporation: *See—*
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Yasuda, Yoshichiro; and Satoh, Seio, 4,545,244, Cl. 73-195.000.

Eberline, William C. Anchor construction. 4,545,318, Cl. 114-299.000.

Eckart, George R.: *See—*
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Edds, Kenneth E.: *See—*
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Eden, George T.: *See—*
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Edlin, George R.; Shumpert, Thomas H.; and Strickland, Brian R., to United States of America, Army. Large broadband free radiating electromagnetic test cell. 4,546,358, Cl. 343-703.000.

Edwards, Robert C.; and Golson, F. Austin, to Amoco Corporation. Process for the recovery of cobalt and manganese from oxidation residue incinerator ash, pyrolysis sand and pyrolysis char. 4,546,202, Cl. 562-414.000.

Effland, Richard C.; and Klein, Joseph T., to Hoechst-Roussel Pharmaceuticals Inc. Pyrrolylaminopiperidines, compositions thereof and methods of use. 4,546,105, Cl. 514-334.000.

Eggendorfer, Andreas J.: *See—*
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Egyesult Izzolampa es Villamossagi Rt.: *See—*
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Ehrlich, Earl A.: *See—*
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Eichelberger, Edward B.; and Lindbloom, Eric, to International Business Machines Corporation. Random pattern self test design. 4,546,473, Cl. 371-25.000.

Eidenschink, Rudolf; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline fluorine-containing cyclohexylbiphenyls and dielectrics and electro-optical display elements based thereon. 4,545,922, Cl. 252-299.630.

Eisai Co., Ltd.: *See—*
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Elattar, Azza A., to Texaco Inc. Process for manufacturing porous slag. 4,545,797, Cl. 65-19.000.

Elias, Richard C., to PPG Industries, Inc. Method for reducing temperature rise of heat sensitive substrates. 4,546,045, Cl. 428-424.600.

Elkem Metals Company: *See—*
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Elkins, Marvin: *See—*
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Elliott, William A.: *See—*
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Elmec Corporation: *See—*
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Elsner, Norbert B.: *See—*
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ELTECH Systems Corporation: *See—*
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Energy Conversion Devices, Inc.: *See—*
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Ovshinsky, Stanford R.; Sapru, Krishna; and Yee, Edmund L., 4,545,883, Cl. 204-192.0SP.

Energy Research Corporation: *See—*
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Engelmann, Manfred; Plewan, Otto; Kraus, Helmut; and Klippert, Heinz, to Hoechst Aktiengesellschaft. Sinterable, finely divided molded material based on polyvinyl chloride. 4,546,135, Cl. 524-158.000.

England, David R., to Rolls-Royce Ltd. Electro chemical machining. 4,545,874, Cl. 204-129.200.

Engle, Thomas H., to General Signal Corporation. Actuators for disc brake calipers. 4,545,465, Cl. 188-72.300.

Engwall, Mats A., to International Business Machines Corporation. Prestressed cylindrical squeeze bearing member. 4,545,625, Cl. 308-5.00R.

Entech, Inc.: *See—*
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Entron Technologies, Inc.: *See—*
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Environmental Control Technology, Inc.: *See—*
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Epson Corporation: *See—*
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Epstein, David M.: *See—*
Herlihy, Walter C.; Epstein, David M.; and Felger, Carl B., 4,546,096, Cl. 514-25.000.

Erfurt, George A.: *See—*
Gellman, Gary; Erfurt, George A.; and Roe, James E., 4,546,001, Cl. 426-549.000.

Ericsson, Sylve J. D., to Svecia Silkscreen Maskiner AB. Drier intended to dry print on a material. 4,545,131, Cl. 34-4.000.

Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I. Photographic material. 4,546,063, Cl. 430-269.000.

Ernster, John H. Hydrolyzed protein composition and process used in preparation thereof. 4,545,933, Cl. 260-119.000.

Erwin Sick GmbH Optik-Elektronik: *See—*
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Erz, Gerhard J.; and Erz, Joseph M. Fluid treatment system and ozone generator therefor. 4,545,960, Cl. 422-186.120.

Erz, Joseph M.: *See—*
Erz, Gerhard J.; and Erz, Joseph M., 4,545,960, Cl. 422-186.120.

Esenovskij-Laskov, Jurij K.: *See—*
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Essex Group, Inc.: *See—*
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Esso Resources Canada Limited: *See—*
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Ethicon, Inc.: *See—*
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Etudes Techniques et Realisations (CdF Ingenierie) S.A.: *See—*
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Etzell, Roger A.; Miller, Bertram J.; and Dziekan, Dennis J., to Glasurit America, Inc. Substrates with flexible coatings from epsilon-caprolactone modified acrylics. 4,546,046, Cl. 428-460.000.

Evans, Lee L.: *See—*
Bingham, David; Evans, Lee L.; and Bradshaw, Peter D., 4,546,324, Cl. 330-9.000.

Evans, Michael W., to General Electric Company. Clock recovery arrangement. 4,546,486, Cl. 375-119.000.

Evert, Karla R., to Stearns Manufacturing Company. Sailboarding personal flotation device. 4,545,773, Cl. 441-114.000.

Exxon Production Research Co.: *See—*
Avicola, Kenneth, 4,545,253, Cl. 73-655.000.

Exxon Research and Engineering Co.; Tiedje, J. Thomas; Morel, Don L.; and Abeles, Benjamin. High-mobility amorphous silicon displaying non-dispersive transport properties. 4,546,009, Cl. 427-39.000.

Exxon Research and Engineering Co.: *See—*
Idenden, John E., 4,545,861, Cl. 203-2.000.
Malghan, Subhaschandra G., 4,545,896, Cl. 209-5.000.
Osman, Robert M., 4,545,976, Cl. 423-650.000.
Rossi, Albert; Rehrer, David H.; Oswald, Alexis A.; Lewtas, Kenneth; and Tack, Robert D., 4,546,137, Cl. 524-217.000.

Fabel, David A.; Hoagland, John C.; and Woodworth, Chester L., to Monsanto Company. Hot melt adhesive delivery system. 4,545,504, Cl. 222-55.000.

Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave, Daniel, to Rhone-Poulenc Sante. Pyrrolo[1,2-c]thiazoles useful as antithrombotic agents. 4,546,100, Cl. 514-231.000.

Fairchild Camera & Instrument Corporation: *See*—
Vora, Madhukar B., 4,545,113, Cl. 29-578.000.

Fairchild Industries, Inc.: *See*—
Renshaw, Theodore A.; and Curatolo, Joseph A., Jr., 4,545,519, Cl. 228-1.100.

Fane, William H., III, to MED-CALL. Remote digital control transmitter device. 4,546,211, Cl. 179-2.00A.

Fantone, Stephen D.; and Johnson, Bruce K., to Polaroid Corporation. Optical viewing system. 4,545,655, Cl. 350-540.000.

Fanuc Ltd.: *See*—
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,546,227, Cl. 219-69.00W.
Kishi, Hajimu; and Seki, Masaki, 4,546,427, Cl. 364-168.000.

Farge, Daniel: *See*—
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave, Daniel, 4,546,100, Cl. 514-231.000.

Farmatic Inc.: *See*—
Jensen, Louis, 4,545,541, Cl. 241-145.000.

Farmer, Julian K.; and Hawk, Charles W., Jr., to Olin Corporation. Multi-compartment disc reactor with improved gas inlet manifold. 4,545,961, Cl. 422-193.000.

Farmer, Ralph W.: *See*—
LaHann, Thomas R.; and Farmer, Ralph W., 4,546,112, Cl. 514-627.000.

Farnam, Jeffrey R. Enhanced mobility wheelchair. 4,545,593, Cl. 280-242.0WC.

Faulkner, Dennis T.: *See*—
Peterson, William J.; and Faulkner, Dennis T., 4,546,293, Cl. 318-254.000.

Faust, Horst: *See*—
Kastl, Erna; Ludwig, Klenk; and Faust, Horst, 4,546,023, Cl. 428-36.000.

Favennec, Pierre N.: *See*—
Salvi, Michel; Favennec, Pierre N.; and Gauneau, Marcel, 4,545,824, Cl. 148-1.500.

Favrel, Jean-Paul; Ouss, Jean; and Pocheau, Jean-Marc, to Compagnie Industrielle des Telecommunications Cit-Alcatel. System for processing channel signalling in a time-division digital exchange. 4,546,469, Cl. 370-77.000.

FBC Limited: *See*—
Rout, Ivan P.; and Gillings, Christopher, 4,546,108, Cl. 514-464.000.
Whitmore, Martyn W.; Pollard, Michael D.; and Smythe, Stephen R., 4,546,174, Cl. 534-838.000.

Fearrington, George W., Jr.: *See*—
Sensabaugh, Andrew J., Jr.; Crepps, Dewitt C.; Rice, William Y., Jr.; and Fearrington, George W., Jr., 4,545,392, Cl. 131-352.000.

Fedij, Victor. Active armor. 4,545,286, Cl. 89-36.020.

Feinberg, Irving; Kraus, Charles J.; and Stoller, Herbert I., to International Business Machines Corporation. Engineering change facility on both major surfaces of chip module. 4,546,413, Cl. 361-410.000.

Feldbakh, Eduard K.: *See*—
Denisov, Roman A.; Tiit, Valdur M.; and Feldbakh, Eduard K., 4,546,256, Cl. 250-372.000.

Feldt, Mats, to Landstingens Inkopscentral LIC. Wheeled structure for supporting a patient in a sitting position. 4,545,085, Cl. 5-81.00R.

Felger, Carl B.: *See*—
Herlihy, Walter C.; Epstein, David M.; and Felger, Carl B., 4,546,096, Cl. 514-25.000.

Fellner, Van N.: *See*—
Lewis, Brett; and Fellner, Van N., 4,545,320, Cl. 116-28.00R.

Fender Musical Instruments Corporation: *See*—
Gagon, Paul R.; and Cox, Roger F., 4,545,278, Cl. 84-1.150.

Fennel, Helmut: *See*—
Bleckmann, Hans-Wilhelm; Loreck, Heinz; Fennel, Helmut; and Zydeck, Michael, 4,546,437, Cl. 364-426.000.

Feres, Vaclav. Film evaporators. 4,545,853, Cl. 159-7.000.

Ferguson, Arthur R., to Outboard Marine Corporation. Outboard motor mounting arrangement. 4,545,770, Cl. 440-61.000.

Ferguson, Walter J., to Dresser Industries, Inc. Integral solid front gauge case for a pressure gauge. 4,545,256, Cl. 73-738.000.

Fernandez, John E.; and LaRocca, William J., to Gulf & Western Manufacturing Company. Integrated console bracket. 4,545,467, Cl. 192-4.00A.

Fernandez, Maria I. M.: *See*—
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Ferraro, Michael V. Detachable earmuffs for headsets. 4,546,215, Cl. 179-156.00R.

Ferrofluidics Corporation: *See*—
Higgins, Donald W., 4,545,587, Cl. 277-80.000.

Ferronniere, Michel; and Cros, Yves, to Zodiac. Pneumatic boats of the inflatable-deflatable type. 4,545,319, Cl. 114-345.000.

Ferruzzi, Claudio, to Industrie Metaimeccaniche Perugia I.M.P. S.p.A. Machine for the encipherment of keys. 4,545,709, Cl. 409-83.000.

Fetty, Harold D.: *See*—
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., 4,545,415, Cl. 152-209.00R.

Feurgard, Rene ; and Baujat, Jacques, to Framatome & Cie. Device for elimination of vibrations of a valve for decompression of an enclosure. 4,545,562, Cl. 251-129.200.

Fiberglas Canada, Inc.: *See*—
Lunt, James; MacPherson, Edwin J.; and Meunier, Paul J., 4,546,119, Cl. 521-131.000.

Fickelscher, Kurt G., to Balcke-Durr AG. Gearbox. 4,545,263, Cl. 74-640.000.

Fickert, Werner: *See*—
Orth, Winfried; and Fickert, Werner, 4,546,190, Cl. 546-303.000.

Field, Cheryl B.; and Lange, Russell C., to International Business Machines Corporation. Method for forming narrow images on semiconductor substrates. 4,546,066, Cl. 430-314.000.

Figari, Alberto A. Contact lens carrying case with magnifying aid apparatus. 4,545,479, Cl. 206-5.100.

Figge International, Inc.: *See*—
Rockerath, John L.; and Blust, Dale K., 4,545,544, Cl. 242-55.000.

Fillod, Maurice; and Larriere, Jean-Francois, to Flonic S.A. Secure coin collection device for pre-payment machine. 4,545,475, Cl. 194-1.00B.

Finke, Robert C.; and Banks, Bruce A., to United States of America, National Aeronautics and Space Administration. Piezoelectric deicing device. 4,545,553, Cl. 244-134.00D.

Firestone, Raymond A. Device for maintaining dry conditions in vessels. 4,545,492, Cl. 215-227.000.

Fischbeck, Kenneth H.; Creagh, Linda T.; and Raschke, Curt R., to Xerox Corporation. Electrothermic ink jet. 4,546,360, Cl. 346-1.100.

Fischer, David M.: *See*—
Sarofeen, Joseph J.; and Fischer, David M., 4,546,379, Cl. 358-42.000.

Fischer, Dieter; and Vatterott, Karl-Heinz, to Triumph-Adler Aktiengesellschaft bur Buro- und Informationstechnik. Arrangements for Fast Readout of n stage arrays of gas discharge chambers. 4,546,288, Cl. 315-169.400.

Fischer, Heinrich: *See*—
Buschhoff, Karl; and Fischer, Heinrich, 4,545,708, Cl. 409-49.000.

Fisher, Harry; and Fisher, Stuart, to Yoshida Kogyo K. K. Apparatus for producing slide fasteners from continuous fastener chain. 4,545,118, Cl. 29-768.000.

Fisher, Stuart: *See*—
Fisher, Harry; and Fisher, Stuart, 4,545,118, Cl. 29-768.000.

Fishman, Jack; and Mayairi, Shinichi, to Rockefeller University, The. Estrogen synthesis inhibitors. 4,546,098, Cl. 514-177.000.

Fitzgerald, David J.: *See*—
Pastan, Ira; Willingham, Mark C.; and Fitzgerald, David J., 4,545,985, Cl. 424-85.000.

Flackett, Dale R.; Jonas, Reinhard; and Trego, Brian R., to Dow Corning Limted; and Perennatorwerk Alfred Hagen GmbH. Organopolysiloxane composition curable to an elastomer and use thereof. 4,546,017, Cl. 427-387.000.

Flair, Henry J.: *See*—
Nielsen, John C.; and Flair, Henry J., 4,545,126, Cl. 33-179.50R.

Flasck, Richard A.: *See*—
Holmberg, Scott H.; and Flasck, Richard A., 4,545,112, Cl. 29-577.00R.

Fleming Steel Company: *See*—
List, John F.; and Nunn, William M., III, 4,545,418, Cl. 160-213.000.

Fletcher-Terry Corporation: *See*—
Kozyrski, Vincent T., 4,545,515, Cl. 225-96.500.

Flinn, Richard A.: *See*—
Bilek, Paul J.; Flinn, Richard A.; McCluhan, Thomas K.; and Trojan, Paul K., 4,545,817, Cl. 75-123.00E.

Flo-Con Systems, Inc.: *See*—
King, Patrick D., 4,545,406, Cl. 137-553.000.

Flonic S.A.: *See*—
Fillod, Maurice; and Larriere, Jean-Francois, 4,545,475, Cl. 194-1.00B.

Flor, James E.: *See*—
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Foam Systems Company: *See*—
Chandler, Larry L.; Friar, Thurston R.; and Green, Berwyn W., 4,546,169, Cl. 528-272.000.

Fogleboch, John R., Sr.: *See*—
Smith, Edwin B.; and Fogleboch, John R., Sr., 4,546,328, Cl. 331-4.000.

Fong, Dodd W.; and Kowalski, David J., to Nalco Chemical Company. Water-soluble sulfonated polymers. 4,546,156, Cl. 526-240.000.

Fontana, Fernando, to Omega SA. Extensible clasp for use with flexible wristlet. 4,545,094, Cl. 24-71.00J.

Fontana, Fernando, to Omega SA. Extensible clasp for use with a flexible wristlet. 4,545,095, Cl. 24-71.00J.

Ford Aerospace & Communications Corporation: *See*—
Place, Thomas M., Jr.; and Crawford, James A., Jr., 4,545,429, Cl. 165-169.000.

Ford Motor Company: *See*—
Amberger, Charles J.; and Lingscheit, James N., 4,546,050, Cl. 428-630.000.
Lake, William R., 4,545,456, Cl. 180-233.000.
Muller, George H., 4,545,600, Cl. 280-668.000.
Muller, George H.; and Chance, Buddy K., 4,545,601, Cl. 280-668.000.
Nielsen, Arnold D., 4,546,403, Cl. 361-154.000.

Wardill, Gordon A., 4,545,172, Cl. 52-795.000.
Fore, William M., to Halliburton Company. Wireline set/tubing retrieve packer type bridge plug. 4,545,431, Cl. 166-183.000.
Forjot, Roland. Apparatus for learning to ski. 4,545,575, Cl. 272-97.000.
Forster, Rolf, to Bernhard Forster GmbH. Orthodontic device. 4,545,760, Cl. 433-18.000.
Forstrom, William J.: *See*—
Carl, Charles L.; Gale, Ronald S.; and Forstrom, William J., 4,545,781, Cl. 493-220.000.
Fory, Werner: *See*—
Meyer, Willy; and Fory, Werner, 4,545,811, Cl. 71-93.000.
Foster Wheeler Energy Corporation: *See*—
Banquy, David L., 4,546,111, Cl. 518-703.000.
Fouts, Robert W., Jr.; Au, Andrew N. S.; Miller, Burton E.; and Gotcher, Alan J., to Raychem Corporation. Conductive polymer compositions and devices. 4,545,926, Cl. 252-511.000.
Fox, David. Silverless photographic medium and process. 4,546,071, Cl. 430-428.000.
Fraikin, Michael: *See*—
Wittler, Fritz; and Fraikin, Michael, 4,545,717, Cl. 414-166.000.
Framatome & Cie: *See*—
Feurgard, Rene ; and Baujat, Jacques, 4,545,562, Cl. 251-129.200.
Francis, William L. High frequency electroplating device. 4,545,884, Cl. 204-202.000.
Frankefort, Arnold V., to Intermate B.V. Apparatus and method for opening and transporting a flat-folded tube of flexible material. 4,545,181, Cl. 53-459.000.
Franx, Cornelis, to U.S. Philips Corporation. Gas analysis apparatus. 4,545,889, Cl. 204-406.000.
Franz, John E.; and Kaufman, Robert J., to Monsanto Company. N(Aminophosphinylmethyl) glycine derivatives. 4,545,804, Cl. 71-86.000.
Franz, Klaus-Dieter: *See*—
Rau, Axel; and Franz, Klaus-Dieter, 4,545,821, Cl. 106-291.000.
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, to Hoffmann-La Roche Inc. Oxime ester herbicides. 4,545,807, Cl. 71-92.000.
Frazee, Ralph E., Jr.; Myers, Daryl L.; and Smithgall, David H., Sr., to AT&T Technologies, Inc. Lightguide fiber spool changeover technique. 4,545,542, Cl. 242-18.00A.
Frederick, Stanley H., to international Telephone and Telegraph Corporation. Swimming pool filtering system. 4,545,906, Cl. 210-138.000.
Freed, Meier E.: *See*—
Abou-Gharbia, Magid A.; Freed, Meier E.; and Colatsky, Thomas J., 4,546,193, Cl. 548-448.000.
Frehn, John L. Telephone sanitary cover. 4,546,217, Cl. 179-185.000.
Frentzel, Richard L., to Celotex Corporation, The. Metal catalyzed preparation of polyoxyalkylene surfactants for phenolic foam stabilization. 4,546,034, Cl. 428-318.400.
Fresenius AG: *See*—
Weber, Wolfram; Neumann, Hans-Jurgen; Meisberger, Artur; and Mathieu, Bernd, 4,545,744, Cl. 417-475.000.
Freyman, Ronald L.; and Roiblum, Yehuda, to AT&T Bell Laboratories. Full output voltage driver circuit using bootstrap capacitor and controlled delay circuitry. 4,546,276, Cl. 307-578.000.
Friar, Thurston R.: *See*—
Chandler, Larry L.; Friar, Thurston R.; and Green, Berwyn W., 4,546,169, Cl. 528-272.000.
Frisch, Kurt C.: *See*—
Peerman, Dwight E.; DiDomenico, Edward; Frisch, Kurt C.; and Meffert, Alfred, 4,546,120, Cl. 521-159.000.
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrimido-2-benzazepines. 4,546,183, Cl. 544-330.000.
Fryszczyn, Bogdan; Bahder, George, deceased; and Bahder, Alice, legal representative, to American Public Power Association. Apparatus and method for prolonging the service life of electrical power cables. 4,545,133, Cl. 34-21.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Iwata, Seiichi, 4,545,457, Cl. 180-247.000.
Morikawa, Kouji, 4,545,347, Cl. 123-308.000.
Fuji Machinery Co., Ltd.: *See*—
Seko, Kiyoshi, 4,545,174, Cl. 53-51.000.
Fuji Photo Film Co., Ltd.: *See*—
Horikawa, Kazuo; and Taniguchi, Yutaka, 4,546,250, Cl. 250-227.000.
Kamei, Sadao; Ohashi, Yuichi; Ukai, Toshinao; Yamamuro, Kiyohiko; and Takei, Haruo, 4,546,074, Cl. 430-573.000.
Kishimoto, Shinzo; Ohno, Shigeru; and Abe, Akira, 4,546,070, Cl. 430-393.000.
Kitaguchi, Hiroshi; Itoh, Isamu; Fujiwara, Itsuo; Nozawa, Yasushi; and Kokubo, Tadayoshi, 4,546,075, Cl. 430-617.000.
Konishi, Masahiro; and Murakoshi, Makoto, 4,546,390, Cl. 360-10.300.
Ohba, Hisao; Shirai, Akira; Kitazumi, Etsuo; and Kato, Norihiko, 4,545,866, Cl. 204-33.000.
Ono, Minoru; Makino, Teruyoshi; and Kikuchi, Hisashi, 4,546,061, Cl. 430-207.000.
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Ryoke, Katsumi; and Tadokoro, Eiichi, 4,546,038, Cl. 428-323.000.
Fuji Xerox Company, Limited: *See*—
Hamano, Toshihisa; Nakamura, Takeshi; and Ito, Hisao, 4,546,243, Cl. 250-211.00R.
Ishitate, Yoshiyuki; and Takahashi, Toshikatsu, 4,545,674, Cl. 355-75.000.
Kurata, Masami; and Ohmori, Takashi, 4,546,381, Cl. 358-78.000.
Ozawa, Takashi, 4,545,672, Cl. 355-3.00R.
Todoh, Hidemasa, 4,546,364, Cl. 346-155.000.
Fujii, Yasuhiko: *See*—
Mori, Takaro; Saito, Susumu; and Fujii, Yasuhiko, 4,546,393, Cl. 360-40.000.
Fujikawa, Kanichi: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Hayashi, Kouji, 4,546,191, Cl. 546-303.000.
Fujikawa, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Control system for sewing machines. 4,545,314, Cl. 112-275.000.
Fujioka, George S.; and Fung, Alexander P., to Dow Chemical Company, The. Chlorine exchange for fluorine in ring-fluorinated pyridine compounds. 4,546,192, Cl. 546-345.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,546,101, Cl. 514-253.000.
Fujita, Shigeyoshi; Kiuchi, Naoyuki; Sasaki, Tomoyuki; and Fukuhara, Kazuyoshi, to Daifuku Co., Ltd. Monorail conveyor system. 4,545,303, Cl. 104-93.000.
Fujitsu Limited: *See*—
Ishikawa, Hiroshi; and Yano, Mitsuhiro, 4,546,479, Cl. 372-45.000.
Ito, Takashi; Sugii, Toshihiro; Fukano, Tetsu; and Horie, Hiroshi, 4,545,114, Cl. 29-579.000.
Miwa, Hirohide, 4,545,250, Cl. 73-602.000.
Nozaki, Shigeki; and Takemae, Yoshihiro, 4,546,457, Cl. 365-230.000.
Okada, Toshiro, 4,546,330, Cl. 331-17.000.
Suzuki, Hirokazu; and Kokado, Masayuki, 4,546,272, Cl. 307-455.000.
Takada, Tadakazu, 4,545,851, Cl. 156-643.000.
Toda, Junzo; and Hiyane, Masao, 4,546,398, Cl. 360-126.000.
Fujiwara, Hidetoshi, to Toyoda Koki Kabushiki Kaisha. Power steering system with engine idling-up mechanism. 4,545,449, Cl. 180-69.300.
Fujiwara, Itsuo: *See*—
Kitaguchi, Hiroshi; Itoh, Isamu; Fujiwara, Itsuo; Nozawa, Yasushi; and Kokubo, Tadayoshi, 4,546,075, Cl. 430-617.000.
Fujiwara, Kenichi; Sugi, Hikaru; and Hasada, Eiichi, to Nippondenso Co., Ltd. Refrigerator for vehicle. 4,545,213, Cl. 6 R-158.000.
Fujiyama, Masaaki: *See*—
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Ryoke, Katsumi; and Tadokoro, Eiichi, 4,546,038, Cl. 428-323.000.
Fujiyama, Yasutomo; and Okabe, Shotaro, to Canon Kabushiki Kaisha. Plasma vapor deposition film forming apparatus. 4,545,328, Cl. 118-723.000.
Fukano, Tetsu: *See*—
Ito, Takashi; Sugii, Toshihiro; Fukano, Tetsu; and Horie, Hiroshi, 4,545,114, Cl. 29-579.000.
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, to Oki Electric Industry Co., Ltd. Dielectric filter. 4,546,333, Cl. 333-202.000.
Fukuda, Mitsuichiro: *See*—
Tanoue, Toyosuke; Sueyasu, Masanobu; Fukuda, Mitsuichiro; and Matsuo, Tohru, 4,545,786, Cl. 48-92.000.
Fukuhara, Kazuyoshi: *See*—
Fujita, Shigeyoshi; Kiuchi, Naoyuki; Sasaki, Tomoyuki; and Fukuhara, Kazuyoshi, 4,545,303, Cl. 104-93.000.
Fukui, Masahisa: *See*—
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,545,881, Cl. 204-192.0SP.
Fukuoka, Kazuya: *See*—
Nagai, Yataro; and Fukuoka, Kazuya, 4,545,588, Cl. 277-93.0SD.
Fung, Alexander P.: *See*—
Fujioka, George S.; and Fung, Alexander P., 4,546,192, Cl. 546-345.000.
Funk, Gary L.; and Bland, Terry E., to Phillips Petroleum Company. Control process for an ammonia manufacturing process. 4,545,971, Cl. 423-359.000.
Furch, Benjamin; and Rost, Friedrich-Wilhelm, to Rheinmetall GmbH. Apparatus for making a pressed body. 4,545,755, Cl. 425-420.000.
Furuta, Kenji, to Olympus Optical Company Limited. Tape recorder. 4,546,399, Cl. 360-137.000.
Furuta, Ryuji: *See*—
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, 4,545,932, Cl. 260-112.50R.
Futami, Toshio: *See*—
Akiba, Yutaka; Futami, Toshio; and Suda, Teruo, 4,546,210, Cl. 174-114.00R.
G-C Dental Industrial Corp.: *See*—
Ohno, Koji; Ohi, Nobukazu; and Hayashi, Syohei, 4,546,006, Cl. 427-2.000.
G. D. Searle & Co.: *See*—
Gaull, Gerald E., 4,545,977, Cl. 424-10.000.
Miyano, Masateru; Villamil, Clara I.; and Shone, Robert L., 4,546,194, Cl. 549-401.000.
G. D. Societa per Azioni: *See*—
Seragnoli, Enzo; and Gamberini, Antonio, 4,545,488, Cl. 209-535.000.
Gabelli, Antonio: *See*—
Bras, Johan C. M.; and Gabelli, Antonio, 4,545,692, Cl. 384-477.000.
Gaetani, Quintino: *See*—
Jacquet, Bernard; Papantoniou, Christos; and Gaetani, Quintino, 4,545,981, Cl. 424-61.000.

Gagliani, John; and Long, John V. Polyimide compositions and foams and methods of making same. 4,546,115, Cl. 521-77.000.
Gagon, Paul R.; and Cox, Roger F., to Fender Musical Instruments Corporation. Apparatus and method for adjusting the characteristic sounds of electric guitars, and for controlling tones. 4,545,278, Cl. 84-1.150.
Gaillard, Adrianus J. C.; and Anderson, Richard N., to Hunter Douglas International N.V. Method and apparatus for manufacturing venetian blinds. 4,545,100, Cl. 29-24.500.
Gajria, Chandrasen; and Ozari, Yehuda, to Celanese Corporation. Water-swellable crosslinked polymeric microgel particles and aqueous dispersions of organic film-forming resins containing the same. 4,546,014, Cl. 427-239.000.
Galbreath, Donald E.; Roudebush, Brooks; and O'Donnell, Robert N., to Galbreath Incorporated. Waste material handling container with liquid tight door seal. 4,545,523, Cl. 232-43.100.
Galbreath Incorporated: *See*—
Galbreath, Donald E.; Roudebush, Brooks; and O'Donnell, Robert N., 4,545,523, Cl. 232-43.100.
Gale, Ronald S.: *See*—
Carl, Charles L.; Gale, Ronald S.; and Forstrom, William J., 4,545,781, Cl. 493-220.000.
Gallien, Jacqueline: *See*—
Kalopissis, Gregoire; Gallien, Jacqueline; Jacquet, Bernard; Bauer, Daniel; and Chalaye, Jean Phillipe, 4,545,978, Cl. 424-10.000.
Galloway, Roy C.: *See*—
Coetzer, Johan; Galloway, Roy C.; Bones, Roger J.; Teagle, David A.; and Moseley, Patrick T., 4,546,055, Cl. 429-103.000.
Gamberini, Antonio: *See*—
Seragnoli, Enzo; and Gamberini, Antonio, 4,545,488, Cl. 209-535.000.
Gamberini, Ernesto, to MG2 S.p.A. Machine for filling a container with pharmaceutical products formed by paste. 4,545,412, Cl. 141-129.000.
Gammill, Ronald B., to Upjohn Company, The. 1-(6-Hydroxy-4- or -7-methoxy-5-Benzofuranyl)-4-substituted-1,3-butanediones. 4,546,177, Cl. 544-58.700.
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, to Fanuc Ltd. Method of reducing wire-cut electric discharge machining errors. 4,546,227, Cl. 219-69.00W.
Garay, Moses D. Detachable arm rest for a motor vehicle. 4,545,619, Cl. 297-416.000.
Garben, Bernd: *See*—
Bauer, Hans J.; and Garben, Bernd, 4,545,115, Cl. 29-590.000.
Garran Enterprises Limited: *See*—
MacCanna, Cathal, 4,545,186, Cl. 56-327.00R.
Garrett Corporation, The: *See*—
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,545,196, Cl. 60-39.230.
Gas Research Institute: *See*—
Mallow, William A., 4,545,820, Cl. 106-76.000.
Gattuso, David A.: *See*—
Izu, Masatsugu; and Gattuso, David A., 4,545,136, Cl. 34-155.000.
Gaughan, Edmund J.: *See*—
Bufalini, Angelo J.; and Gaughan, Edmund J., 4,545,805, Cl. 71-87.000.
Gaull, Gerald E., to G. D. Searle & Co. Compositions and methods for treating severe acne with isotretinoin. 4,545,977, Cl. 424-10.000.
Gauneau, Marcel: *See*—
Salvi, Michel; Favennec, Pierre N.; .and Gauneau, Marcel, 4,545,824, Cl. 148-1.500.
Gaus, Ernst. Cold box for motor vehicles. 4,545,211, Cl. 62-115.000.
Gazzi, Luigi; Rescalli, Carlo; Scaramucci, Maria A.; and Ginnasi, Alessandro, to Snamprogetti, S.p.A. Process of selective separation of hydrogen sulfide from gaseous mixtures containing also carbon dioxide. 4,545,965, Cl. 423-229.000.
Gebauer, Gerhard, to Hoechst Aktiengesellschaft. Primer coating composition for topcoats of fluorocarbon polymers containing a polyarylene sulfide resin, an aromatic polyether-sulfone resin or an aromatic polyether-ketone resin. 4,546,141, Cl. 524-401.000.
Gebben, Vernon D., to International Harvester Company. Shaft torque measuring system. 4,545,261, Cl. 73-862.330.
Gebr. Bode & Co. GmbH: *See*—
Jentsch, Wolfgang, 4,545,149, Cl. 49-255.000.
Gebrauchs Gerate GmbH: *See*—
Wolfrum, Emil, 4,546,011, Cl. 427-179.000.
Gebruder Lodige Maschinenbau-Gesellschaft mbH: *See*—
Schluter, Wilhelm, 4,546,013, Cl. 427-220.000.
GEC Avionics Limited: *See*—
Tucker, Christopher J., 4,546,433, Cl. 364-200.000.
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Gellman, Gary; Erfurt, George A.; and Roe, James E., to Nabisco Brands, Inc. Canine biscuit containing discrete particles of meat and other materials and method for making same. 4,546,001, Cl. 426-549.000.
Gene Esparza, Natividad. Method and apparatus for determining route from a present location to a desired destination in a city. 4,546,439, Cl. 364-444.000.
General Dynamics/Pomona Division: *See*—
KaDell, Charles W., Jr., 4,545,570, Cl. 269-52.000.
Piesik, Edward T., 4,545,284, Cl. 89-1.819.
General Electric Company: *See*—
Evans, Michael W., 4,546,486, Cl. 375-119.000.
Keane, John J.; and Pauze, Denis R., 4,546,041, Cl. 428-372.000.
Laghi, Aldo A., 4,545,952, Cl. 264-328.200.
Mendiratta, Ashok K.; and Sikdar, Subhas K., 4,546,207, Cl. 568-723.000.
General Electric Company, p.l.c., The: *See*—
Todd, Anthony G.; and Wickenden, Dennis K., 4,546,373, Cl. 357-67.000.
General Foods Corporation: *See*—
Katz, Saul N.; and Skiff, Ronald H., 4,545,998, Cl. 426-424.000.
Leshik, Richard R.; Swallow, Nancy A.; Leusner, Steven J.; and DiGiovacchino, David J., 4,546,002, Cl. 426-576.000.
Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., 4,545,999, Cl. 426-548.000.
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,546,000, Cl. 426-548.000.
General Instrument Corporation: *See*—
Glaab, Joseph B., 4,546,387, Cl. 358-186.000.
General Kinematics Corporation: *See*—
Musschoot, Albert; and Kraus, Richard B., 4,545,509, Cl. 222-198.000.
General Motors Corporation: *See*—
Abu-Isa, Ismat A.; and McIntyre, Dorthie J., 4,545,614, Cl. 297-284.000.
General Signal Corporation: *See*—
Engle, Thomas H., 4,545,465, Cl. 188-72.300.
Genetics International, Inc.: *See*—
Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,545,382, Cl. 128-635.000.
Genth, Hermann: *See*—
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Pena-Finol, Jesus S.; and Connelly, Joseph A., 4,546,275, Cl. 307-498.000.
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Himmler, Gunther; and Wenz, Friedrich, 4,545,239, Cl. 73-146.000.
Gerber Garment Technology, Inc.: *See*—
Pearl, David R., 4,545,275, Cl. 83-747.000.
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, to APX Group, Inc. Welded tube and flange, e.g., for exhaust manifold. 4,545,605, Cl. 285-189.000.
Gerber Products Company: *See*—
Chrones, Anthony, 4,545,378, Cl. 128-360.000.
Rogers, William R.; and Liescheidt, Duane B., 4,545,125, Cl. 33-572.000.
Gerken, Donald L.: *See*—
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Germond, Henry S., to Speed Cut, Inc. Hip, valley and jack rafter cutting apparatus. 4,545,274, Cl. 83-486.100.
Gharadjedaghi, Fereydoun; and Guyenet, Jean-Francois, to Asulab S.A. - ETA 72. Electro-optical display device of point matrix type. 4,545,649, Cl. 350-356.000.
GHT Gesellschaft fur Hochtemperaturreaktor-Technik mbH: *See*—
Ullrich, Manfred; Reutler, Herbert; and Schepers, Hubert, 4,545,954, Cl. 376-220.000.
Giaimo, Anthony; Larsen, Robert H.; and Rodda, Donald, to Singer Company, The. Thread tensioning device for a sewing machine. 4,545,311, Cl. 112-254.000.
Gibbons, Gould, Jr.: *See*—
Starkenberg, John J.; and Gibbons, Gould, Jr., 4,545,829, Cl. 149-109.600.
Gibson, Walter G.; Plotnick, Michael ...; and Chen, Thomas Y., to RCA Corporation. Video disc encoding and decoding system providing intra-field track error correction. 4,546,389, Cl. 358-342.000.
Gilbreath, James C. Outboard motor support bracket. 4,545,559, Cl. 248-642.000.
Giles, George B.; Ross, Donald B.; McCallion, Joseph J.; and Sherritt, William C., to Giles Tool Agencies Limited. Burner attachment for aerosol container. 4,545,759, Cl. 431-344.000.
Giles, Richard E.; Stevens, David R.; and Wiesehahn, Gary P., to Advanced Genetics Research Institute. Psoralen inactivated double-stranded RNA viral vaccines. 4,545,987, Cl. 424-89.000.
Giles Tool Agencies Limited: *See*—
Giles, George B.; Ross, Donald B.; McCallion, Joseph J.; and Sherritt, William C., 4,545,759, Cl. 431-344.000.
Gillette Company, The: *See*—
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Gillies, George M.; Kennett, Leslie P.; and Mathews, Clive A., to British Nuclear Fuels Limited. Rotary kiln assemblies, method of changing seal arrangements and seal arrangements for use in a rotary kiln assembly. 4,545,764, Cl. 432-115.000.
Gillings, Christopher: *See*—
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Gilman, Norman W.: *See*—
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Ginnasi, Alessandro: *See*—
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Giocello, Debbie A. Method for designing apparel. 4,546,434, Cl. 364-300.000.
Giovanni, Caltabiano. Plowing implement provided with rotary tools. 4,545,438, Cl. 172-123.000.
Giruckij, Olgert I.: *See*—
Hau, Antonin; Srubar, Jiri ; Esenovskij-Laskov, Jurij K.; and Giruckij, Olgert I., 4,545,264, Cl. 74-688.000.

Giurtino, Joel F.: *See—*
Bournay, Frederick M., Jr.; and Giurtino, Joel F., 4,545,381, Cl. 128-419.00P.

GKSS-Forschungszentrum Geesthacht GmbH: *See—*
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Glaab, Joseph B., to General Instrument Corporation. Circuit for providing accurately spaced video and sound carriers. 4,546,387, Cl. 358-186.000.

Gladisch, Manfred; and Winklmann, Erwin, to Deutsche Babcock Werke Aktiengesellschaft. Motor and gearing to drive a valve. 4,546,281, Cl. 310-83.000.

Glasurit America, Inc.: *See—*
Etzell, Roger A.; Miller, Bertram J.; and Dziekan, Dennis J., 4,546,046, Cl. 428-460.000.

Glazer, Edward A., to Pfizer Inc. Antiprotozoal diamidines. 4,546,113, Cl. 514-636.000.

Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, to Robert Bosch GmbH. Fuel injection system. 4,545,353, Cl. 123-454.000.

Goddijn, Bernardus H. A., deceased; and by de Haan, Friedrich J., administrator, to U.S. Philips Corporation. Mains-voltage discrimination device. 4,546,305, Cl. 323-299.000.

Goldman, Irina, to OMI International Corporation. Bath and process for high speed electroplating of palladium. 4,545,869, Cl. 204-47.000.

Goldman, Robert N., to Light Signatures, Inc. Non-counterfeitable document system. 4,546,352, Cl. 340-825.340.

Golledge, Ian: *See—*
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Golson, F. Austin: *See—*
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Gomez, Daniel; and Bartoli, Giampaolo, to Arjomari-Prioux. Method for preparing a fibrous product containing cellulosic fibers and useful in particular, in the field of coverings in lieu of asbestos. 4,545,854, Cl. 162-135.000.

Gomez, Eduardo: *See—*
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Gonser, Donald I.; Eden, George T.; and Tateosian, Louis H., to Dentsply Research & Development Corp. Denture curing apparatus and method. 4,546,261, Cl. 250-492.100.

Goodyear Tire & Rubber Company, The: *See—*
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Marshall, Richard P., 4,545,718, Cl. 414-401.000.
Prewitt, William T.; and Van Dyke, James A., 4,546,438, Cl. 364-473.000.
Richards, Jimmy L., 4,546,031, Cl. 428-222.000.
Rye, Grover W.; and Palmer, Kenneth J., 4,545,190, Cl. 57-212.000.
Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., 4,545,834, Cl. 156-124.000.

Gordon, John H. Method and apparatus for belling pipe ends. 4,545,951, Cl. 264-322.000.

Gore, David W.: *See—*
Gore, Wilbert L.; Gore, Robert W.; and Gore, David W., 4,545,862, Cl. 203-10.000.

Gore, Robert W.: *See—*
Gore, Wilbert L.; Gore, Robert W.; and Gore, David W., 4,545,862, Cl. 203-10.000.

Gore, Wilbert L.; Gore, Robert W.; and Gore, David W., to W. L. Gore & Associates, Inc. Desalination device and process. 4,545,862, Cl. 203-10.000.

Gorham, Mary. Disposable underarm perspiration pad. 4,545,080, Cl. 2-54.000.

Gotah, Eizo; Tomishima, Takeshi; Tsutsumi, Tadao; and Komuro, Yoshiyuki, to Toray Industries, Inc. Method for continuous polycondensation of higher aliphatic ω-amino acid particles. 4,546,171, Cl. 528-310.000.

Gotcher, Alan J.: *See—*
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Goto, Toshio: *See—*
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Gotoh, Miyuki; and Wada, Yoshimi, to Nissan Motor Company, Limited. Weft sensor for a loom. 4,546,263, Cl. 250-561.000.

Gould Inc.: *See—*
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Grabos, Fred F., to Boeing Company, The. Tooling for and method of fabricating master models. 4,545,102, Cl. 29-407.000.

Gradeff, Peter S.; Charte, Vincent J.; Schreiber, Fred G.; and Davison, John F., to Rhone-Poulenc Inc. Process for preparing colloidal ceric oxide and complexes thereof with free organic acids. 4,545,923, Cl. 252-309.000.

Graefer, Albrecht: *See—*
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Graiver, Daniel; and Kalinowski, Robert E., to Dow Corning Corporation. Conductive elastomers from electrically conductive fibers in silicone emulsion. 4,545,914, Cl. 252-511.000.

Grammes, Hartwig: *See—*
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Grass, William E.: *See—*
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Graves, J. W.: *See—*
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Gray, Joe B. Method and apparatus for assisting in and facilitating the coupling of a trailer tongue to a vehicle latch. 4,545,595, Cl. 280-477.000.

Green, Berwyn W.: *See—*
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Green, William P.: *See—*
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Greenwood, Ivan, to Singer Company, The. Optical gyroscope. 4,545,682, Cl. 356-350.000.

Gregor, Alexander: *See—*
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

Gresser, Herbert D.; and Nussenbaum, Joseph, to Group II Manufacturing Ltd. Creation of a parting zone in a crystal structure. 4,546,231, Cl. 219-121.0LN.

Gretag Aktiengesellschaft: *See—*
Luscher, Rene , 4,545,675, Cl. 355-76.000.

Grether, Paul; Brader, Kurt; and Keller, Bruno, to Sulzer Brothers Limited. Window. 4,545,160, Cl. 52-172.000.

Grewal, Narinder S.: *See—*
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Griffiths, David C.: *See—*
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Griffiths, David H.; and Wright, Larry G., to PPG Industries, Inc. Method and apparatus for producing uniform strands from a split fiber glass bushing. 4,546,485, Cl. 373-28.000.

Grimm, Duane H., to Sundstrand Corporation. Narrow tolerance range slip clutch. 4,545,470, Cl. 192-56.00R.

Grimm, Hans, to Maschinenfabrik Gehring, GmbH & Co. Kommanditgesellschaft. Grinding apparatus. 4,545,152, Cl. 51-103.00R.

Grimm, Wolfgang; and Schurle, Hermann, to Carl-Zeiss-Stiftung. Method and apparatus for testing lenses. 4,545,678, Cl. 356-124.000.

Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the production of stabilized polyisocyanates of retarded reactivity and their use in the production of polyurethanes. 4,546,165, Cl. 528-53.000.

Gronebaum, Theo: *See—*
Biewald, Heinz; Gronebaum, Theo; and Kuper, Hans-Heinrich, 4,545,845, Cl. 156-544.000.

Gronholm, Richard A.: *See—*
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Grossmann, Frederic; and Sims, Larry A., to American Hospital Supply Corporation. System and method for bandaging a patient. 4,545,371, Cl. 128-132.00D.

Group II Manufacturing Ltd.: *See—*
Gresser, Herbert D.; and Nussenbaum, Joseph, 4,546,231, Cl. 219-121.0LN.

Grove Valve & Regulator Company: *See—*
Connolly, Walter L.; and Ray, Harold T., 4,545,231, Cl. 72-335.000.

Grow, Harlow B. Internal combustion heat engine and cycle therefor. 4,545,346, Cl. 123-305.000.

Gruber, Arthur W.; and Smith, Loren C., to BOC Group, Inc., The. Pressure relieving device. 4,545,400, Cl. 137-467.000.

Grumman Aerospace Corporation: *See—*
Alario, Joseph P.; Kosson, Robert; and Leszak, Edward, 4,545,427, Cl. 165-104.260.
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Boles, Sol, 4,546,355, Cl. 343-17.000.

GTE Laboratories Incorporated: *See—*
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GTE Products Corporation: *See—*
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GTE Valeron Corporation: *See—*
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Guenther, William D., to Dana Corporation. Composite thermal shield for engine components. 4,546,048, Cl. 428-608.000.

Gueret, Jean-Louis H.; and Arraudeau, Jean-Pierre, to L'Oreal. Make-up brush. 4,545,393, Cl. 132-88.500.

Guilford Kapwood Limited: *See—*
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Gulf Canada Limited: *See—*
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Gulf Research & Development Co.: *See—*
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Gulf & Western Manufacturing Company: *See—*
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Gupta, Anil; and Perlegos, George, to Seeq Technology, Inc. Nonvolatile memory cell fuse element. 4,546,454, Cl. 365-200.000.

Gusack, James A.; and Smith, Thomas E., to Badische Corporation. Method of forming supported antistatic yarn. 4,545,835, Cl. 156-180.000.

Guscott, John K.; and Casamassima, Mario, to American District Telegraph Company. Temperature compensated alarm system. 4,546,344, Cl. 340-501.000.

Gutta, John J.: *See*—
Rhodes, William H.; Pitt, Caryl S.; and Gutta, John J., 4,545,799, Cl. 65-59.210.

Guyenet, Jean-Francois: *See*—
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H-C Industries, Inc.: *See*—
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H. Lorenz GmbH: *See*—
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H. Stoll GmbH & Co.: *See*—
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Haas, Peter; Avar, Geza; and Grammes, Hartwig, to Bayer Aktiengesellschaft. Use of polyhydroxyalkyl monoureas for polyurethane foams, dispersions of the polyhydroxyalkyl monoureas in polyols and new tris-hydroxyalkyl monoureas. 4,546,121, Cl. 521-164.000.

Haase, James W.: *See*—
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Habasaki, Toshimi: *See*—
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Habicht, Volker E. Device for string instruments for adjusting chords. 4,545,281, Cl. 84-315.000.

Hackett, Kenneth P. Rotating garbage can rack with cover. 4,545,629, Cl. 312-252.000.

Hackwood, Susan: *See*—
Beni, Gerardo; Bridges, Thomas J.; Hackwood, Susan; and Lin, Chinlon, 4,545,713, Cl. 414-1.000.

Hafele KG: *See*—
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Hafner, Gunther; Noreikat, Karl-Ernst; Schmidt, Hans-Dieter; Letsche, Ulrich; and Bauer, Bernhard, to Daimler-Benz Aktiengesellschaft. Method for controlling the position of an actuator in a manner whereby the adjustment is adaptive. 4,546,426, Cl. 364-153.000.

Haga, Takahiro: *See*—
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Hait, Paul W., to Pyromid, Inc. Outdoor stove. 4,545,359, Cl. 126-9.00R.

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Halliburton Company: *See*—
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Hamaguchi, Takehiko; Hazama, Kiyoaki; Iwaida, Kenichi; and Iguchi, Takeyoshi, to Konishiroku Photo Industry Co., Ltd. Folding camera with movable member mounting an objective lens and reflex mirror. 4,545,661, Cl. 354-86.000.

Hamano, Toshihisa; Nakamura, Takeshi; and Ito, Hisao, to Fuji Xerox Company, Limited. Elongated light receiving element assembly. 4,546,243, Cl. 250-211.00R.

Hammer, Joel B.; and Gronholm, Richard A., to Westinghouse Electric Corp. Dynamoelectric machine with rotor ventilation system including exhaust coolant gas diffuser and noise baffle. 4,546,279, Cl. 310-59.000.

Hanamoto, Keiji; and Takagi, Fumio, to Dai Nippon Insatsu Kabushiki Kaisha. Device for injection molding articles while simultaneously forming patterns thereon. 4,545,752, Cl. 425-112.000.

Handa, Kenichi: *See*—
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Hanota Holdings SA: *See*—
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Hans S. Singer Co., Inc.: *See*—
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Hanson, David G.: *See*—
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Hara, Susumu: *See*—
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Hara, Toshitami: *See*—
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Hara, Yoichi: *See*—
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Harasaki, Hayathugu, to Mazda Motor Corporation. Front side structure of an automobile body. 4,545,612, Cl. 296-185.000.

Hardouin, Pierre: *See*—
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Harmon, Barry J.: *See*—
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Harris, Thomas M. Baseball-strike indicator and trajectory analyzer and method of using same. 4,545,576, Cl. 273-25.000.

Harrison, James E., to Antelope Oil Tool & Manufacturing Company. Centralizer band-collar connection. 4,545,436, Cl. 166-241.000.

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Hart, Walter D.: *See*—
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Hartmann, James R., to SKIL Corporation. Combination jig saw adjusting mechanism. 4,545,123, Cl. 30-393.000.

Hartness, Thomas P.: *See*—
Hartness, Thomas S.; and Hartness, Thomas P., 4,545,173, Cl. 53-48.000.

Hartness, Thomas S.; and Hartness, Thomas P. Apparatus for securing cartons on the top of articles carried in a case. 4,545,173, Cl. 53-48.000.

Hartwig, Carl S. M., to Institut Cerac S.A. Magnetizable core for accommodating electrical conductors in an electrical machine, and a method of manufacturing such a core. 4,546,282, Cl. 310-218.000.

Harvey, Michael J.; and Atkinson, Anthony, to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The. Media for affinity chromatography. 4,546,161, Cl. 527-312.000.

Hasada, Eiichi: *See*—
Fujiwara, Kenichi; Sugi, Hikaru; and Hasada, Eiichi, 4,545,213, Cl. 6 R-158.000.

Hase, Yoshifumi: *See*—
Nagumo, Shinichi; Toda, Yoshio; Nakajima, Yasuo; and Hase, Yoshifumi, 4,545,333, Cl. 123-41.020.

Hasegawa, Eiichi: *See*—
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.

Hasegawa, Tadao: *See*—
Nakagawa, Takayoshi; and Hasegawa, Tadao, 4,545,334, Cl. 123-41.330.

Hasenauer, Dieter: *See*—
Jessen, Jens C.; and Hasenauer, Dieter, 4,546,056, Cl. 429-149.000.

Hashimoto, Takatsugu; and Ohashi, Takashi, to Bridgestone Tire Co., Ltd. Low-resilience rubber compositions and foams. 4,546,127, Cl. 523-219.000.

Haskins, Glenn M.: *See*—
Rand, Robert W.; Snow, Harold D.; Elliott, David G.; and Haskins, Glenn M., 4,545,368, Cl. 128-1.300.

Hastings, Jerome K.: *See*—
Petrie, Dennis J.; and Hastings, Jerome K., 4,546,336, Cl. 335-16.000.
Petrie, Dennis J.; Bridges, Robert B.; Grass, William E.; and Hastings, Jerome K., 4,546,337, Cl. 335-16.000.

Hatori, Yoshinori: *See*—
Matsumoto, Shuichi; Hatori, Yoshinori; Murakami, Hitomi; and Yamamoto, Hideo, 4,546,386, Cl. 358-136.000.

Hattan, Mark, to Green, William P., a part interest. Method of forming a fatigue resistant threaded connection. 4,545,104, Cl. 29-446.000.

Hattori, Kyo: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, 4,546,338, Cl. 335-229.000.

Hatzikelis, Christopher: *See*—
Madonia, Ciro; Hatzikelis, Christopher; and Cosentino, Cesare C., 4,546,022, Cl. 428-31.000.

Hau, Antonin; Srubar, Jiri ; Esenovskij-Laskov, Jurij K.; and Giruckij, Olgert I., to Ustav pro vyzkum motorovych vozidel. Automatic differential transmission gear. 4,545,264, Cl. 74-688.000.

Haugen, Paul R., to Honeywell Inc. Systolic computational array. 4,546,445, Cl. 364-728.000.

Hawk, Charles W., Jr.: *See*—
Farmer, Julian K.; and Hawk, Charles W., Jr., 4,545,961, Cl. 422-193.000.

Hayakawa, Kizo: *See*—
Kinoshita, Masao; Yamanaka, Teruo; Hayakawa, Kizo; and Sugimoto, Takao, 4,545,238, Cl. 73-117.300.

Hayakawa, Yoichi: *See*—
Sakakibara, Shiro; and Hayakawa, Yoichi, 4,545,779, Cl. 474-240.000.

Hayashi, Hiroshi: *See*—
Yamamoto, Saburo; Hayashi, Hiroshi; and Yano, Seiki, 4,546,481, Cl. 372-48.000.

Hayashi, Kouji: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Hayashi, Kouji, 4,546,191, Cl. 546-303.000.

Hayashi, Syohei: *See*—
Ohno, Koji; Ohi, Nobukazu; and Hayashi, Syohei, 4,546,006, Cl. 427-2.000.

Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Cooling system for automotive engine or the like. 4,545,335, Cl. 123-41.270.

Hayashi, Yoshitaka: *See*—
Kimura, Masahiro; Hayashi, Yoshitaka; and Yoshida, Ryohei, 4,545,537, Cl. 241-36.000.

Hayman, Cecil: *See*—
Chalk, Christine D.; and Hayman, Cecil, 4,545,916, Cl. 252-70.000.

Haynes, H. Taylor: *See*—
Laughon, Thomas C.; Haynes, H. Taylor; Klopach, Robert T.; and Warner, Richard C., 4,546,357, Cl. 343-702.000.

Hays, Dan A.; and Wayman, William H., to Xerox Corporation. Low voltage electrophotography with simultaneous photoreceptor charging, exposure and development. 4,545,669, Cl. 355-3.00R.

Hays, James M.: *See*—
Canalizo, Carlos R.; and Hays, James M., 4,545,731, Cl. 417-86.000.

Hazama, Kiyoaki: *See*—
Hamaguchi, Takehiko; Hazama, Kiyoaki; Iwaida, Kenichi; and Iguchi, Takeyoshi, 4,545,661, Cl. 354-86.000.

Hazelett Strip-Casting Corporation: *See*—
Platek, Stanley W.; Desautels, S. Jerry; and Szczypiorski, Wojtek, 4,545,423, Cl. 164-481.000.

Hazen, Gary A.: *See*—
Minerbo, Gerald N.; and Hazen, Gary A., 4,546,315, Cl. 324-221.000.

HBOG-Oil Sands Limited: *See*—
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., 4,545,892, Cl. 208-11.0LE.

Heath Company: *See*—
Ashton, Robert H., 4,546,348, Cl. 340-715.000.

Hedrick, Ross M.: *See*—
Woodbrey, James C.; Moncur, Marlowe V.; and Hedrick, Ross M., 4,546,147, Cl. 525-183.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Allylated di or polycyclopentadiene diphenols and thermosettable compositions containing same. 4,546,129, Cl. 523-456.000.

Hefner, Robert E., Jr., to Dow Chemical Company, The. Polymer modified cyanate mixture and epoxy resins thereof. 4,546,131, Cl. 523-466.000.

Hegarty, William P., to Air Products and Chemicals, Inc. Process for producing by-product oxygen from turbine power generation. 4,545,787, Cl. 55-16.000.

Hehl, Karl. Injection molding machine with self-connecting ejection device. 4,545,753, Cl. 425-350.000.

Heinemann, Otto, to Krupp Polysius AG. Method and apparatus for the pneumatic conveyance of fine material. 4,545,704, Cl. 406-32.000.

Helbig, Joachim; and Schmidbaur, Hubert, to Verla-Pharm, Arzneimittelfabrik, Apotheker H.J.v. Ehrlich GmbH & Co. KG. Process for the production of amino-dicarboxylic acid-bivalent metal-halogen complexes and such complexes. 4,546,195, Cl. 556-50.000.

Helios Research Corp.: *See*—
Nicodemus, Carl D., 4,545,739, Cl. 417-152.000.

Helix Technology Corporation: *See*—
Young, Niels O., 4,545,209, Cl. 62-6.000.
Young, Niels O., 4,545,738, Cl. 417-53.000.

Hellsten, Karl M. E., to Berol Kemi AB. Process for froth flotation. 4,545,898, Cl. 209-166.000.

Hellwig, Reimar, to Hottinger Baldwin Measurements, Inc. Force measuring device or load cell. 4,545,262, Cl. 73-862.650.

Hendricks, Willard E. Golf ball heater. 4,545,362, Cl. 126-263.000.

Henes, Martin E.; and Roth, George, to Spiral Binding Company, Inc. Ring binding with broadened rings. 4,545,603, Cl. 281-21.00A.

Henkel Corporation: *See*—
Peerman, Dwight E.; DiDomenico, Edward; Frisch, Kurt C.; and Meffert, Alfred, 4,546,120, Cl. 521-159.000.

Henkel KGaA: *See*—
Diekotter, Friedrich W.; Honges, Edgar; Just, Gunther; Smolka, Heinz-Gerd; and Wust, Willi, 4,545,969, Cl. 423-328.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Moller, Hinrich; Wallat, Siegfried; and Bartnik, Friedhelm, 4,545,984, Cl. 424-70.000.
Upadek, Horst; and Bruns, Klaus, 4,545,930, Cl. 252-522.00R.

Hennion, Claude: *See*—
Lewiner, Jacques; Perino, Didier; and Hennion, Claude, 4,546,257, Cl. 250-388.000.

Henry Mann, Inc.: *See*—
Dodd, John R., 4,545,608, Cl. 294-87.100.

Hensens, Otto D.: *See*—
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Hepp, Peter S., to Sun Carriers, Inc. Apparatus for automated less-than-truck load shipments. 4,545,710, Cl. 410-32.000.

Herb, Eugen, to Trumpf GmbH & Co. Stamping or nibbling machine. 4,545,272, Cl. 83-165.000.

Herbert, Frank P.; and Barnard, Maxwell K. Graphic computer system and keyboard. 4,546,435, Cl. 364-300.000.

Herlihy, Walter C.; Epstein, David M.; and Felger, Carl B., to Repligen Corporation; and Gillette Company, The. Anticholinergic glucuronides and antiperspirant use thereof. 4,546,096, Cl. 514-25.000.

Herrmann, Willy: *See*—
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, 4,545,605, Cl. 285-189.000.

Hershey Foods Corporation: *See*—
Wong, Carl Y.; Khan, Mir N.; and Mihalik, John A., 4,545,997, Cl. 426-94.000.

Herskowitz, Ira: *See*—
Kurjan, Janet; and Herskowitz, Ira, 4,546,082, Cl. 435-172.300.

Hess, Heinrich: *See*—
Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,546,165, Cl. 528-53.000.

Hetland, Timothy A.: *See*—
Ballarini, John A.; and Hetland, Timothy A., 4,545,867, Cl. 204-33.000.

Hettel, Hans: *See*—
Muller, Hanns P.; Hettel, Hans; Wagner, Kuno; and Vogtel, Peter, 4,546,116, Cl. 521-106.000.

Hetz, Walter; and Weber, Peter, to Siemens AG. Manually operated ultrasound application. 4,545,386, Cl. 128-660.000.

Heuvelmans, Jean J.; Couwenberg, Winston D.; and Ligthart, Franciscus A. S., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,546,285, Cl. 313-25.000.

Hewlett-Packard Company: *See*—
Barton, Donald L., 4,545,852, Cl. 156-643.000.
DaSilva, Marcus K.; Whipple, David P.; and Temple, Robert E., 4,546,331, Cl. 332-19.000.
Drowley, Clifford I., 4,545,823, Cl. 148-1.500.
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.

Heyneman, Guido: *See*—
Vanhumbeeck, Jacky; Danneels, Laurent; De Steur, Hubert; and Heyneman, Guido, 4,545,957, Cl. 422-81.000.

Hibar Systems Ltd.: *See*—
Barall, Heinz, 4,545,507, Cl. 222-137.000.

Hida, Yukio: *See*—
Ogasawara, Takaaki; Maruyama, Tokuji; Sato, Masaharu; Hida, Yukio; and Saito, Takashi, 4,546,234, Cl. 219-137.0PS.

Hiersteiner, Walter, to Tension Envelope Corporation. Envelope with hanger. 4,545,521, Cl. 229-68.00R.

Higgins, Brian D. Well tool. 4,545,434, Cl. 166-217.000.

Higgins, Charles H.; and Skipper, John D., to United States of America, Air Force. Data acquisition channel apparatus. 4,546,343, Cl. 340-347.0AD.

Higgins, Donald W., to Ferrofluidics Corporation. Coaxial, multiple-shaft ferrofluid seal apparatus. 4,545,587, Cl. 277-80.000.

Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., to Genetics International, Inc. Sensor for components of a liquid mixture. 4,545,382, Cl. 128-635.000.

Hill, Hugh A. O.: *See*—
Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,545,382, Cl. 128-635.000.

Hill, Michael P., to Dow Corning Ltd. Organosiloxanes and preparation thereof. 4,545,980, Cl. 424-60.000.

Hillis, Maurice R. Method and apparatus for etching copper. 4,545,877, Cl. 204-130.000.

Hilti Aktiengesellschaft: *See*—
Kolter, Martin, 4,546,235, Cl. 219-230.000.

Hilts, John R. Method for preventing cylinder head warpage, and over-heating of internal combustion engines. 4,545,101, Cl. 29-156.40R.

Himmler, Gunther; and Wenz, Friedrich, to Gerb. Hofmann GmbH & Co. KG. Method and apparatus for controlling the quality of tires. 4,545,239, Cl. 73-146.000.

Himukai, Mamoru, to Sanyo Electric Co., Ltd. Vacuum cleaner. 4,545,794, Cl. 55-362.000.

Hinnen, John. Activity center. 4,545,768, Cl. 434-304.000.

Hino, Naganori: *See*—
Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,545,812, Cl. 71-103.000.

Hinton, George F., to United States of America, Navy. Free nuclear precession gradiometer system. 4,546,317, Cl. 324-301.000.

Hiraga, Ryozo: *See*—
Kuroki, Yoichi; Yoshinari, Yukihiro; and Hiraga, Ryozo, 4,545,684, Cl. 356-400.000.

Hirai, Hidefumi; Komiyama, Makoto; and Hara, Susumu, to Hirai, Hidefumi. Solid adsorbent for unsaturated hydrocarbon and process for separation of unsaturated hydrocarbon from gas mixture. 4,546,094, Cl. 502-402.000.

Hirai, Kiyomiki: *See*—
Hirose, Takeshi; Ito, Nobuo; Hirai, Kiyomiki; and Takeuchi, Koji, 4,546,155, Cl. 525-504.000.

Hirai, Koichi: *See*—
Nagano, Mitsuo; Hirai, Koichi; Kitamura, Kouichi; Shinkai, Kenkichi; and Yasuda, Hiroshi, 4,545,942, Cl. 260-465.00D.

Hirano, Hiroyuki: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,545,265, Cl. 74-868.000.

Hirano, Shin-ichi; and Naka, Shigeharu, to Toshiba Tungaloy Co., Ltd. Methods for preparing cubic boron nitride sintered body and cubic boron nitride, and method for preparing boron nitride for use in the same. 4,545,968, Cl. 423-290.000.

Hirooka, Susumu: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,545,929, Cl. 252-520.000.

Hirose, Takeshi; Ito, Nobuo; Hirai, Kiyomiki; and Takeuchi, Koji, to Ajinomoto Co., Inc. Latent curing agents for epoxy resins. 4,546,155, Cl. 525-504.000.

Hiroshi, Sakurai; and Yong Chul, Kim. Hydraulic clamping apparatus for an injection molding machine. 4,545,756, Cl. 425-590.000.

Hiroyasu, Minoru; Yamagishi, Shigeru; Yamashita, Hideo; Yamada, Susumu; and Takahashi, Koji, to Honda Giken Kogyo Kabushiki Kaisha. Method and machine for machining the surface of a valve seat. 4,545,706, Cl. 408-1.0BD.

Hitachi Koki Co., Ltd.: *See*—
Komatsu, Isamu; Anzai, Masayasu; Hoshi, Nobuyoshi; and Akimaru, Susumu, 4,545,325, Cl. 118-645.000.

Hitachi, Ltd.: *See*—
Akiba, Yutaka; Futami, Toshio; and Suda, Teruo, 4,546,210, Cl. 174-114.00R.
Komatsu, Isamu; Anzai, Masayasu; Hoshi, Nobuyoshi; and Akimaru, Susumu, 4,545,325, Cl. 118-645.000.
Nakazawa, Terumi; Minorikawa, Hitoshi; and Kawakami, Kazuhiko, 4,546,412, Cl. 361-395.000.
Sawada, Hideo, 4,546,447, Cl. 364-767.000.
Suzuki, Ryo; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,546,452, Cl. 365-36.000.
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,546,168, Cl. 528-107.000.
Tamura, Takahiro; Kuno, Hiroaki; Uchikawa, Naoshi; Murayama, Akira; and Mizuno, Takao, 4,545,747, Cl. 418-55.000.
Tomioka, Shunzoo; Nakano, Masaaki; Okano, Kinpei; Shimizu, Kousaku; and Yoda, Hiroaki, 4,545,741, Cl. 417-365.000.
Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, 4,546,222, Cl. 200-144.00B.
Yamaguti, Terushige; Miki, Toshinori; Mannaka, Toshio; Koyama, Hiroshi; and Kawano, Yukihiro, 4,545,228, Cl. 72-16.000.

Hiyane, Masao: *See*—
Toda, Junzo; and Hiyane, Masao, 4,546,398, Cl. 360-126.000.

Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, to American Cyanamid Company. Platinum chelates of 3-amino-substituted-[1,2,4]triazolo[1,5-a]-pyrimidin-7(3H)-ones. 4,546,181, Cl. 544-225.000.

Hoagland, John C.: *See*—
Fabel, David A.; Hoagland, John C.; and Woodworth, Chester L., 4,545,504, Cl. 222-55.000.

Hockett, Wayne B. Universal abrasive cleaning apparatus. 4,545,156, Cl. 51-410.000.

Hodac, Francoise: *See*—
Bondiou, Jean-Claude; Hodac, Francoise; and Legroux, Didier, 4,546,185, Cl. 546-133.000.

Hoechst Aktiengesellschaft: *See*—
Engelmann, Manfred; Plewan, Otto; Kraus, Helmut; and Klippert, Heinz, 4,546,135, Cl. 524-158.000.
Gebauer, Gerhard, 4,546,141, Cl. 524-401.000.
Kastl, Erna; Ludwig, Klenk; and Faust, Horst, 4,546,023, Cl. 428-36.000.
Prave, Paul; and Sittig, Wolfgang, 4,545,945, Cl. 261-36.00R.
Weil, Joachim; and Sattelmeyer, Richard, 4,546,143, Cl. 524-511.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Effland, Richard C.; and Klein, Joseph T., 4,546,105, Cl. 514-334.000.

Hoffmann-La Roche Inc.: *See*—
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,545,807, Cl. 71-92.000.
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, 4,546,183, Cl. 544-330.000.

Hoffmann, Wolfgang, to B & H Manufacturing Company, Inc. Machine and method for applying heat shrink labels. 4,545,832, Cl. 156-86.000.

Hofmann, Karl; and Trachte, Dietrich, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,545,530, Cl. 239-73.000.

Hohlwegler, Heinrich: *See*—
Vischer, Daniel; and Volkart, Peter, 4,545,403, Cl. 137-497.000.

Holden, Irving H., to Motorola, Inc. Movable electrical contact capable of accommodating devices exhibiting a plurality of different sizes. 4,545,639, Cl. 339-256.00R.

Holenstein, Hans, to BBC Brown, Boveri & Company, Limited. Electron tube, in particular a transmitter tube. 4,546,286, Cl. 313-296.000.

Holl, Lothar: *See*—
Schilling, Hans-Dieter; and Holl, Lothar, 4,545,959, Cl. 422-142.000.

Holl, Walter, to Robert Bosch GmbH. Method and apparatus of protecting a coating plant against explosion. 4,546,400, Cl. 361-1.000.

Holliger, Karl, to Sulzer-Escher Wyss Ltd. Turbine. 4,545,726, Cl. 415-26.000.

Holmberg, Scott H.; and Flasck, Richard A., to Alphasil Incorporated. Method of manufacturing thin film transistors and transistors made thereby. 4,545,112, Cl. 29-577.00R.

Holvoet, Marcel; and Picard, Bernard, to Beghin-Say S.A. Non-woven material for medical compresses. 4,546,027, Cl. 428-109.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hiroyasu, Minoru; Yamagishi, Shigeru; Yamashita, Hideo; Yamada, Susumu; and Takahashi, Koji, 4,545,706, Cl. 408-1.0BD.
Kanemura, Shinji; and Tachikawa, Shoji, 4,545,455, Cl. 180-197.000.
Naito, Hiroyasu, 4,546,345, Cl. 340-542.000.
Nakano, Yoshikatsu; and Matsuura, Masaaki, 4,545,342, Cl. 123-198.00F.
Oike, Ikuo; and Miyata, Takahide, 4,545,200, Cl. 60-314.000.
Sato, Makoto; and Tsuch, Yoshikazu, 4,545,623, Cl. 307-92.000.

Honeywell Inc.: *See*—
Haugen, Paul R., 4,546,445, Cl. 364-728.000.

Honges, Edgar: *See*—
Diekotter, Friedrich W.; Honges, Edgar; Just, Gunther; Smolka, Heinz-Gerd; and Wust, Willi, 4,545,969, Cl. 423-328.000.

Honkomp, John R.: *See*—
Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., 4,546,430, Cl. 364-200.000.

Hood, Robert G., to Vascutek Limited. Vascular prosthesis. 4,545,082, Cl. 623-1.000.

Hoogland, Jan. Flat field lenses. 4,545,652, Cl. 350-432.000.

Hoover Company, The: *See*—
Oxel, Berton R., 4,545,089, Cl. 15-323.000.

Horacek, Heinrich; Wittmann, Otto; Marx, Matthias; and Mayer, Johann, to BASF Aktiengesellschaft. Process for bonding lignocellulose-containing raw materials with a prepolymer based on a urethane-modified diphenylmethane diisocyanate mixture. 4,546,039, Cl. 428-357.000.

Hori, Kuniyuki; and Kitazawa, Kiyoshi, to Shinko Electric Industries Co., Inc. Selective electroplating apparatus having a cleaning device. 4,545,885, Cl. 204-207.000.

Horie, Hiroshi: *See*—
Ito, Takashi; Sugii, Toshihiro; Fukano, Tetsu; and Horie, Hiroshi, 4,545,114, Cl. 29-579.000.

Horikawa, Kazuo; and Taniguchi, Yutaka, to Fuji Photo Film Co., Ltd. Detector in an image read-out system. 4,546,250, Cl. 250-227.000.

Horikoshi, Yukio: *See*—
Sakamaki, Hiroshi; and Horikoshi, Yukio, 4,545,749, Cl. 418-173.000.

Horiuchi, Masami: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,545,428, Cl. 165-110.000.

Horlander, Frank J.: *See*—
Bartlett, John C.; Bohnhoff, Alan E.; Croley, Donald F.; Dyer, Stanley; Edds, Kenneth E.; Horlander, Frank J.; and Stafford, Donald W., 4,545,693, Cl. 400-120.000.

Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Lubricants containing polyhydroxy hydrocarbylamines. 4,545,915, Cl. 252-515.00R.

Horvath, Carlos F., to Burroughs Corporation. Multiple control stores in a pipelined microcontroller for handling jump and return subroutines. 4,546,431, Cl. 364-200.000.

Hoshi, Nobuyoshi: *See*—
Komatsu, Isamu; Anzai, Masayasu; Hoshi, Nobuyoshi; and Akimaru, Susumu, 4,545,325, Cl. 118-645.000.

Hosoda, Kenichiro: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,546,333, Cl. 333-202.000.

Hospal Industrie: *See*—
Marze, Xavier, 4,545,910, Cl. 210-651.000.

Hottinger Baldwin Measurements, Inc.: *See*—
Hellwig, Reimar, 4,545,262, Cl. 73-862.650.

Houghten, Richard A., to Scripps Clinic and Research Foundation. Synthetic heat-stable enterotoxin polypeptide of *Escherichia coli*. 4,545,931, Cl. 260-112.50R.

Hounsell, Melvin W. Microbial culture apparatus. 4,546,086, Cl. 435-287.000.

Hovey, Frederick A.: *See*—
Collins, Floyd K.; Hovey, Frederick A.; and Maninger, Loren L., 4,546,287, Cl. 313-414.000.

Howard, Guy D.; and Bosso, Alexander, to Combustion Engineering, Inc. Combined primary and spare submerged scraper conveyor arrangement. 4,545,305, Cl. 110-165.00R.

Hsiao, Yu-Sheng; and Cheng, Huey-Der. Safety steel angle assembly rack. 4,545,490, Cl. 211-191.000.

Hsu, Joanna K.: *See*—
Hyzak, Daniel L.; Pallos, Ferenc M.; and Hsu, Joanna K., 4,546,199, Cl. 560-165.000.

Hubele, Adolf; and Riebli, Peter, to Ciba-Geigy Corporation. Organotin compounds and pesticidal compositions. 4,546,109, Cl. 514-493.000.

Huber & Suhner AG: *See*—
Bosshard, Andreas; and Lammler, Bernhard, 4,545,637, Cl. 339-177.00E.

Hudak, Jozef: *See*—
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

Hudiksvalls Mekaniska Aktiebolag: *See*—
Bas, Olov A., 4,545,454, Cl. 180-139.000.

Huebner, Hans F. Method of treating weight loss disorders. 4,546,103, Cl. 514-282.000.

Huggins, Raymond W., to Xerox Corporation. Isolated high voltage controller. 4,546,262, Cl. 250-551.000.

Hughes Aircraft Company: *See*—
Bridges, William B., 4,545,878, Cl. 204-157.10R.
Chern, Mao-Jin; Smith, Ronald T.; and Peters, John W., 4,545,646, Cl. 350-162.200.

Hull, John L.: *See*—
Trembley, John F.; and Hull, John L., 4,546,226, Cl. 219-10.810.

Hultmark, Eric B.; Metreaud, Claude G.; and Yacavonis, Robert A., to International Business Machines Corporation. Heat sink for electronic package. 4,546,405, Cl. 361-386.000.

Hunt-Wesson Foods, Inc.: *See*—
Cage, James K.; and Villena, Edgardo I., 4,545,953, Cl. 264-533.000.

Hunter Douglas International N.V.: *See*—
Gaillard, Adrianus J. C.; and Anderson, Richard N., 4,545,100, Cl. 29-24.500.
Hurst, Jerry C.: *See*—
Cartwright, John S.; and Hurst, Jerry C., 4,545,761, Cl. 432-5.000.
Huttlin, Herbert, to Condair AG. Device and process for precipitating foreign matter from a gas stream. 4,545,792, Cl. 55-241.000.
Hyzak, Daniel L.; Pallos, Ferenc M.; and Hsu, Joanna K., to Stauffer Chemical Company. Halogenated allylthioisopropyl N-methyl carbamates as herbicide extenders. 4,546,199, Cl. 560-165.000.
IC Gas International Limited: *See*—
Chalk, Christine D.; and Hayman, Cecil, 4,545,916, Cl. 252-70.000.
ICI Americas Inc.: *See*—
Campbell, James B., Jr.; and Bare, Thomas M., 4,546,104, Cl. 514-293.000.
Robertson, John R., 4,546,154, Cl. 525-474.000.
Idenden, John E., to Exxon Research and Engineering Co. Fractionation system. 4,545,861, Cl. 203-2.000.
Ido, Akinori; and Uchida, Goro , to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Air conditioner for vehicle. 4,545,526, Cl. 237-12.30A.
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Rotary driving apparatus. 4,546,338, Cl. 335-229.000.
Igarashi, Hideaki: *See*—
Kobayashi, Waichi; Yoshida, Kozaburo; and Igarashi, Hideaki, 4,545,975, Cl. 423-636.000.
Igarashi, Yoshinori: *See*—
Niinomi, Masahiro; Okubo, Yukihiro; Igarashi, Yoshinori; and Yoshinari, Masashi, 4,546,166, Cl. 528-60.000.
Iguchi, Takeyoshi: *See*—
Hamaguchi, Takehiko; Hazama, Kiyoaki; Iwaida, Kenichi; and Iguchi, Takeyoshi, 4,545,661, Cl. 354-86.000.
Ihlow, Rolf. Onion peeling device. 4,545,297, Cl. 99-586.000.
Iida, Takamitsu: *See*—
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.
Iimori, Hiroshi: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,545,702, Cl. 405-269.000.
Iio, Takeshi, to Sanshin Kogyo Kabushiki Kaisha. Propeller. 4,545,771, Cl. 440-89.000.
IIT Research Institute: *See*—
Bridges, Jack E.; and Taflove, Allen, 4,545,435, Cl. 166-248.000.
Ikeda, Naotaka: *See*—
Ishida, Katsuyuki; and Ikeda, Naotaka, 4,545,220, Cl. 68-133.000.
Ikeda, Takahiro: *See*—
Niwa, Katsuhisa; and Ikeda, Takahiro, 4,545,667, Cl. 354-419.000.
Ikeda, Takashi; and Odawara, Masachika, to Tokyo Shibaura Denki Kabushiki Kaisha. Stress corrosion cracking proof steam turbine. 4,545,725, Cl. 415-180.000.
Ikeuchi, Masaki: *See*—
Nakao, Kazushige; Ikeuchi, Masaki; Ozaki, Eiichi; and Yumikura, Tsuneo, 4,545,217, Cl. 62-476.000.
Ikeura, Kenji, to Nissan Motor Company, Ltd. Idle speed control method and system for an internal combustion engine. 4,545,348, Cl. 123-339.000.
Illinois Tool Works Inc.: *See*—
Dewey, George G., 4,545,270, Cl. 81-429.000.
Klygis, Mindaugas J., 4,545,480, Cl. 206-151.000.
Nielsen, John C.; and Flair, Henry J., 4,545,126, Cl. 33-179.50R.
Rodseth, William G.; and Peterson, Francis C., 4,546,408, Cl. 361-386.000.
Imamichi, Tutomu, to Omron Tateisi Electronics Co. System for performing transactions. 4,546,240, Cl. 235-379.000.
Imperial Chemical Industries Australia Limited: *See*—
Parris, David, 4,546,204, Cl. 568-697.000.
Imperial Chemical Industries PLC: *See*—
Andrew, Sydney P. S., 4,545,351, Cl. 123-440.000.
Ims, Horst O. H., to Uniroyal, Ltd. Diaphragm pump having a valve sheet with inlet and outlet flaps and having antisiphoning capability during pump shutdown. 4,545,735, Cl. 417-307.000.
Incom International Inc.: *See*—
McCloskey, Albert R., 4,545,626, Cl. 308-6.00C.
Industrial Automation Corp.: *See*—
Peyton, John J.; and Watt, Bryan K., 4,546,247, Cl. 250-223.00B.
Industrias Romi S/A: *See*—
Romi, Giordano, 4,545,271, Cl. 82-32.000.
Romi, Romeu, 4,545,757, Cl. 425-593.000.
Industrie Metaimeccaniche Perugia I.M.P. S.p.A.: *See*—
Ferruzzi, Claudio, 4,545,709, Cl. 409-83.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Brescia, Riccardo; Manini, Enrico; Balbo, Edoardo; and Scardovi, Alessandro, 4,546,361, Cl. 346-140.00R.
Ing. Rudolf Hell GmbH: *See*—
Beisswenger, Siegfried; and Boppel, Wolfgang, 4,546,232, Cl. 219-121.0EJ.
Ingersoll-Rand Company: *See*—
Buse, Frederic W., 4,545,585, Cl. 277-22.000.
Ingram, Gary L., to Spencer Wright Industries, Inc. Tufting machines. 4,545,312, Cl. 112-256.000.
Inland Steel Company: *See*—
Rastogi, Prabhat K., 4,545,827, Cl. 148-31.550.
Innes, Robert A.; and Swift, Harold E., to Gulf Research & Development Co. Fluidized bed process for producing acrylonitrile and catalytic mixture containing antimony oxide-silica composite used therein. 4,545,943, Cl. 260-465.300.
Inokawa, Michio; Watanabe, Minoru; Miyasaka, Yoshiteru; and Watanabe, Toshio, to Tokyo Land Corporation; Nippon Light Metal Co., Ltd.; and Shin Nikkei Company, Ltd. Roof ridge ventilation apparatus. 4,545,292, Cl. 98-42.210.
Inoue, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Refrigeration apparatus. 4,545,215, Cl. 62-216.000.
Inoue, Shigeyasu; and Yamamoto, Hiroyoshi, to United Kingdom Atomic Energy Authority. Aqueous ink compositions for ball-point pens. 4,545,818, Cl. 106-22.000.
Inoue, Takao; Maeda, Yukio; and Uchida, Masami, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing an optical recording/reproducing disc. 4,546,464, Cl. 369-280.000.
Inoue, Yoshikazu: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,546,101, Cl. 514-253.000.
INRIA Institute National de Recherche en Informatique et en Automatique: *See*—
Abramatic, Jean-Francois; Nadler, Morton; and Letellier, Philippe, 4,546,383, Cl. 358-85.000.
Institut Cerac S.A.: *See*—
Hartwig, Carl S. M., 4,546,282, Cl. 310-218.000.
Institut Fiziki Akademii Nauk Estonskoi SSR: *See*—
Denisov, Roman A.; Tiit, Valdur M.; and Feldbakh, Eduard K., 4,546,256, Cl. 250-372.000.
Institute po Metaloznanie i Technologia na Metalite: *See*—
Marinov, Mihail T.; Petkanchin, Lyubomir T.; Pushev, Georgi I.; Kostov, Georgi T.; Mihovski, Mitko M.; and Manolova, Valentina A., 4,545,252, Cl. 73-633.000.
Integral Hydraulik & Co.: *See*—
Luhmer, Horst, 4,545,409, Cl. 137-625.640.
Integrated Ceilings Inc.: *See*—
Carey, Bruce P.; and O'Toole, Richard M., 4,545,165, Cl. 52-488.000.
Intel Corporation: *See*—
Volk, Andrew; and McAfee, Christopher, 4,546,472, Cl. 371-15.000.
Intermate B.V.: *See*—
Frankefort, Arnold V., 4,545,181, Cl. 53-459.000.
International Business Machines Corporation: *See*—
Amendola, Albert; Schmeckenbecher, Arnold F.; and Sobon, Joseph T., 4,546,065, Cl. 430-313.000.
Anastassiou, Dimitris, 4,546,385, Cl. 358-133.000.
Bartlett, John C.; Bohnhoff, Alan E.; Croley, Donald F.; Dyer, Stanley; Edds, Kenneth E.; Horlander, Frank J.; and Stafford, Donald W., 4,545,693, Cl. 400-120.000.
Bauer, Hans J.; and Garben, Bernd, 4,545,115, Cl. 29-590.000.
Eichelberger, Edward B.; and Lindbloom, Eric, 4,546,473, Cl. 371-25.000.
Engwall, Mats A., 4,545,625, Cl. 308-5.00R.
Feinberg, Irving; Kraus, Charles J.; and Stoller, Herbert I., 4,546,413, Cl. 361-410.000.
Field, Cheryl B.; and Lange, Russell C., 4,546,066, Cl. 430-314.000.
Hultmark, Eric B.; Metreaud, Claude G.; and Yacavonis, Robert A., 4,546,405, Cl. 361-386.000.
Kirkman, David H.; Lowe, Anthony C.; Wood, John C.; and Golledge, Ian, 4,545,650, Cl. 350-357.000.
Ko, Ming; Oxsen, Michael E.; and Prime, Robert B., 4,546,035, Cl. 428-315.900.
Lakritz, Mark N.; Ordonez, Jose; and Tubiola, Peter J., 4,545,610, Cl. 29-589.000.
Simpson, Robert A.; Trotter, Ralph R.; and Weber, Edward V., 4,546,260, Cl. 250-491.100.
International Flavors & Fragrances Inc.: *See*—
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,546,208, Cl. 568-814.000.
International Harvester Company: *See*—
Gebben, Vernon D., 4,545,261, Cl. 73-862.330.
International Minerals & Chemical Corp.: *See*—
Berry, William W., 4,545,962, Cl. 423-20.000.
International Telephone and Telegraph Corporation: *See*—
Frederick, Stanley H., 4,545,906, Cl. 210-138.000.
Morton, Steven G., 4,546,428, Cl. 364-200.000.
Interox Chemicals Limited: *See*—
Sanderson, William R., 4,545,784, Cl. 8-107.000.
Intersil, Inc.: *See*—
Bingham, David; Evans, Lee L.; and Bradshaw, Peter D., 4,546,324, Cl. 330-9.000.
Iowa State University Research Foundation, Inc.: *See*—
Kraus, George A., 4,545,935, Cl. 260-245.700.
Irving, Edward; and Smith, Terence J., to Ciba Geigy Corporation. Image production utilizing multifunctional light sensitive compounds. 4,546,067, Cl. 430-325.000.
ISCO, Inc.: *See*—
Tehrani, Abolghassem Y.; Jones, John N.; and Allington, Robert W., 4,545,904, Cl. 210-96.100.
Isett, Donald D.: *See*—
Treadwell, Stephen S.; and Isett, Donald D., 4,545,310, Cl. 112-121.110.
Ishida, Katsuyuki; and Ikeda, Naotaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Washing machine. 4,545,220, Cl. 68-133.000.
Ishihara Sangyo Kaisha Ltd.: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Hayashi, Kouji, 4,546,191, Cl. 546-303.000.

Ishikawa, Hiroshi; and Yano, Mitsuhiro, to Fujitsu Limited. Semiconductor light-emitting device with layers having different band gaps. 4,546,479, Cl. 372-45.000.

Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Yorita, Tadahiro, 4,546,334, Cl. 333-206.000.

Ishitate, Yoshiyuki; and Takahashi, Toshikatsu, to Fuji Xerox Company, Limited. Original placing stand device. 4,545,674, Cl. 355-75.000.

Ishizumi, Kikuo; Muramatsu, Michihisa; Sato, Hiromi; Tanno, Norihiko; and Yoshida, Noboru, to Sumitomo Chemical Company, Limited. Novel aminonaphthacene derivatives and process for preparation thereof. 4,545,936, Cl. 260-377.000.

Isobe, Teruhiko, to Pioneer Video Corporation. Method for recording information on a recording disc. 4,546,461, Cl. 369-50.000.

Ito, Hisao: *See*—
Hamano, Toshihisa; Nakamura, Takeshi; and Ito, Hisao, 4,546,243, Cl. 250-211.00R.

Ito, Katsumi: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,545,453, Cl. 180-131.000.

Ito, Masafumi; Nishimura, Shuichi; and Hara, Yoichi, to Nissan Motor Co., Ltd. Auxiliary air supply apparatus for an internal combustion engine. 4,545,331, Cl. 123-26.000.

Ito, Masakazu; and Izawa, Hikaru, to NCR Corporation. Automatic document page turning apparatus. 4,545,141, Cl. 40-531.000.

Ito, Nobuo: *See*—
Hirose, Takeshi; Ito, Nobuo; Hirai, Kiyomiki; and Takeuchi, Koji, 4,546,155, Cl. 525-504.000.

Ito, Takashi; Sugii, Toshihiro; Fukano, Tetsu; and Horie, Hiroshi, to Fujitsu Limited. Method of producing semiconductor device. 4,545,114, Cl. 29-579.000.

Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, to Toyota Jidosha Kabushiki Kaisha. Method for regulating intake air flow for internal combustion engines. 4,545,349, Cl. 123-339.000.

Itoh, Isamu: *See*—
Kitaguchi, Hiroshi; Itoh, Isamu; Fujiwara, Itsuo; Nozawa, Yasushi; and Kokubo, Tadayoshi, 4,546,075, Cl. 430-617.000.

Itoh, Katsuyuki; Itoh, Shinichi; and Otsuki, Michiaki, to Oki Electric Industry Co., Ltd. Developing apparatus using magnetic developer. 4,545,670, Cl. 355-3.0DD.

Itoh, Kunio: *See*—
Shimizu, Hirokazu; Itoh, Kunio; Sugino, Takashi; and Wada, Masaru, 4,546,478, Cl. 372-36.000.

Itoh, Michio; Tsukamoto, Takehiro; Watanabe, Shuichi; Kinoshita, Takeshi; and Tomita, Seisuke, to Bridgestone Tire Co., Ltd. Radial tires. 4,545,416, Cl. 152-539.000.

Itoh, Shinichi: *See*—
Itoh, Katsuyuki; Itoh, Shinichi; and Otsuki, Michiaki, 4,545,670, Cl. 355-3.0DD.

ITT Industries, Inc.: *See*—
Bleckmann, Hans-Wilhelm; Loreck, Heinz; Fennel, Helmut; and Zydeck, Michael, 4,546,437, Cl. 364-426.000.
Kohler, Alfred; and Krizek, Oldrich, 4,545,088, Cl. 15-250.350.
Rose, Jochen, 4,546,219, Cl. 200-11.00R.

Iwagami, Fusao, to Sharp Kabushiki Kaisha. Nozzle cleaning device for an ink jet system printer. 4,546,363, Cl. 346-140.00R.

Iwahashi, Hiroshi; and Ochii, Kiyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device. 4,546,455, Cl. 365-200.000.

Iwaida, Kenichi: *See*—
Hamaguchi, Takehiko; Hazama, Kiyoaki; Iwaida, Kenichi; and Iguchi, Takeyoshi, 4,545,661, Cl. 354-86.000.

Iwashita, Kiyoji: *See*—
Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, 4,546,222, Cl. 200-144.00B.

Iwata, Seiichi, to Fuji Jukogyo Kabushiki Kaisha. Gear shifting apparatus of a transmission for a four-wheel drive vehicle. 4,545,457, Cl. 180-247.000.

Izawa, Hikaru: *See*—
Ito, Masakazu; and Izawa, Hikaru, 4,545,141, Cl. 40-531.000.

Izeki, Jiro; and Shimoda, Ikuo, to Oiles Kogyo Kabushiki Kaisha. Vibration damping apparatus. 4,545,466, Cl. 188-268.000.

Izu, Masatsugu; and Gattuso, David A., to Sovonics Solar Systems. Isolation valve. 4,545,136, Cl. 34-155.000.

Izumi, Asashiro; and Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Cover apparatus for weighing machines. 4,545,630, Cl. 312-285.000.

Izzo, Henry J.; and McNaught, John P., to Lever Brothers Company. Edible composition comprising discrete fat-bearing particles in a fat-bearing matrix. 4,546,003, Cl. 426-581.000.

J. I. Case Company: *See*—
Cochran, Gary L.; and Baum, Dean O., 4,545,720, Cl. 414-723.000.
Van Ooyen, Richard C., 4,545,624, Cl. 305-9.000.

J. M. Voith GmbH: *See*—
Schilder, Hans, 4,545,734, Cl. 416-146.00A.

Jackrel, Donald. Method for fabricating a glove with an intermediate membrane layer. 4,545,841, Cl. 156-290.000.

Jackson, Alan D., to Cessna Aircraft Company, The. Metered lockout valve. 4,545,287, Cl. 91-420.000.

Jacobs Manufacturing Co., The: *See*—
Richey, Clyde D., 4,545,628, Cl. 312-235.00A.

Jacobson, Robert E. Method and instruments for performing a percutaneous lumbar diskectomy. 4,545,374, Cl. 128-303.00R.

Jacquemet, Bernard; and Ravet, Jean-Paul, to Merlin Gerin. High voltage metal-clad circuit breaker. 4,546,223, Cl. 200-148.00R.

Jacquet, Bernard; Papantoniou, Christos; and Gaetani, Quintino, to L'Oreal. Nail enamel containing polytetrahydrofuran as a resin. 4,545,981, Cl. 424-61.000.

Jacquet, Bernard: *See*—
Kalopissis, Gregoire; Gallien, Jacqueline; Jacquet, Bernard; Bauer, Daniel; and Chalaye, Jean Phillipe, 4,545,978, Cl. 424-10.000.

Jadwin, Thomas A.: *See*—
Miskinis, Edward T.; and Jadwin, Thomas A., 4,546,060, Cl. 430-108.000.

Jaggle, Gunther; and Schonemann, Walter, to Robert Bosch GmbH. Fuel injection valve. 4,545,354, Cl. 123-470.000.

Jagst, Peter, to Trutzschler GmbH & Co. Kg. Sliver coiler. 4,545,093, Cl. 19-159.00R.

Jahn, Dieter; Becker, Rainer; Keil, Michael; Spiegler, Wolfgang; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 5-(Oxo or thio heterocycle) cyclohexane-1,3-dione derivatives and their use for controlling undesirable plant growth. 4,545,806, Cl. 71-88.000.

James, Claude: *See*—
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave, Daniel, 4,546,100, Cl. 514-231.000.

Jamiolkowski, Dennis D.: *See*—
Koelmel, Donald F.; Jamiolkowski, Dennis D.; Shalaby, Shalaby W.; and Bezwada, Rao S., 4,546,152, Cl. 525-437.000.

Janick, Jules; and Kononowicz, Halina M., to Purdue Research Foundation. Asexual embryogenesis of callus from *theobroma cacao* L. 4,545,147, Cl. 47-58.000.

Janson, Mats O., to Tylo Sauna S.A. Wall mounting arrangement for sauna heating units. 4,546,236, Cl. 219-365.000.

Januszkiewicz, Stanley: *See*—
Charkey, Allen; and Januszkiewicz, Stanley, 4,546,058, Cl. 429-223.000.

Japan Exlan Company, Ltd.: *See*—
Kobashi, Toshiyuki; and Naka, Hideo, 4,546,146, Cl. 524-831.000.
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.

Japan Spectroscopic Co., Ltd.: *See*—
Watanabe, Shinichiro, 4,545,681, Cl. 356-325.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Niinomi, Masahiro; Okubo, Yukihiro; Igarashi, Yoshinori; and Yoshinari, Masashi, 4,546,166, Cl. 528-60.000.

Jarvis, Kevin M., to Singer Company, The. Scene simulator. 4,545,765, Cl. 434-43.000.

Jastrzebski, Lubomir L.: *See*—
Blackstone, Scott C.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,546,375, Cl. 357-23.400.

Jenkins, John F. Body cooling device. 4,545,379, Cl. 128-399.000.

Jensen, Hans-Erik K.; Abildgaard, Niels; and Nielsen, Steen H., to Danfoss A/S. Ultrasonic measuring apparatus. 4,545,259, Cl. 73-861.280.

Jensen, Jens C.: *See*—
Bisgaard, Hans F.; and Jensen, Jorgen D., 4,545,491, Cl. 215-11.00D.

Jensen, Jorgen D.: *See*—
Bisgaard, Hans F.; and Jensen, Jorgen D., 4,545,491, Cl. 215-11.00D.

Jensen, Louis, to Farmatic Inc. Multiple roll roller mill. 4,545,541, Cl. 241-145.000.

Jensen, Roger A. Screen printing apparatus and process comprising chamber with movable upper surface-squeegee combination. 4,545,300, Cl. 101-123.000.

Jentsch, Wolfgang, to Gebr. Bode & Co. GmbH. Device for securing the locked position of a motor-vehicle door. 4,545,149, Cl. 49-255.000.

Jessen, Jens C.; and Hasenauer, Dieter, to Brown, Boveri & Cie AG. High-temperature storage battery. 4,546,056, Cl. 429-149.000.

JGC Corporation: *See*—
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.

Jidosha Kiki Co., Ltd.: *See*—
Kobayashi, Michio, 4,545,206, Cl. 60-554.000.

Joerns Healthcare, Inc.: *See*—
Peterson, Warren J., 4,545,084, Cl. 5-69.000.

Johansson, Arne; and Ajslev, Sven, to A/S Nunc. Cell cultivation container. 4,546,085, Cl. 435-284.000.

Johansson, Kjell. Mounting device. 4,545,425, Cl. 165-89.000.

John, E. Roy. Self-normed brain state monitoring. 4,545,388, Cl. 128-731.000.

John Wyeth & Brother Limited: *See*—
Crossley, Roger; and Dickinson, Kay H., 4,546,187, Cl. 546-193.000.

Johns Hopkins University, The: *See*—
Schneider, Wolfger; and Johns, Richard J., 4,546,436, Cl. 364-415.000.

Johns, Richard J.: *See*—
Schneider, Wolfger; and Johns, Richard J., 4,546,436, Cl. 364-415.000.

Johnson, Bruce K.: *See*—
Fantone, Stephen D.; and Johnson, Bruce K., 4,545,655, Cl. 350-540.000.

Johnson, David E.; and Myers, Donald W., to Mobil Oil Corporation. Apparatus and method for forming stacks of nested containers each having a predetermined count of containers. 4,545,714, Cl. 414-30.000.

Johnson, Fred: *See*—
Newman, Robert; and Johnson, Fred, 4,545,840, Cl. 156-276.000.
Johnson, Gerald H., to Control Data Corporation. Method and apparatus for optimally tuning clock signals for digital computers. 4,546,269, Cl. 307-269.000.
Johnson & Johnson Products, Inc.: *See*—
Lauritzen, Nels J., 4,545,372, Cl. 128-156.000.
Johnson, Kelli J. Wall receptacle recessed box contained light intensity on/off controlled night light system. 4,546,419, Cl. 362-95.000.
Johnson, Robert R., to Energy Conversion Devices, Inc. Method for making, parallel preprogramming or field programming of electronic matrix arrays. 4,545,111, Cl. 29-574.000.
Johnson, Robert R., to Brown & Williamson Tobacco Corporation. Cigarette filter. 4,545,391, Cl. 131-336.000.
Jonas, Reinhard: *See*—
Flackett, Dale R.; Jonas, Reinhard; and Trego, Brian R., 4,546,017, Cl. 427-387.000.
Jones, Donald D., to Trac 4 Inc. Drive mechanism for steering wheels of vehicle. 4,545,458, Cl. 180-255.000.
Jones, Howard: *See*—
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,546,106, Cl. 514-345.000.
Jones, John N.: *See*—
Tehrani, Abolghassem Y.; Jones, John N.; and Allington, Robert W., 4,545,904, Cl. 210-96.100.
Jones, Patrick: *See*—
Wilson, Louis D.; and Jones, Patrick, 4,545,247, Cl. 73-473.000.
Josam Developments, Inc.: *See*—
Botnick, Irlin H., 4,545,533, Cl. 239-282.000.
Joslyn Mfg. and Supply Co.: *See*—
deSouza, Alwyn A.; and Eggendorfer, Andreas J., 4,546,402, Cl. 361-120.000.
Joto Chemical Company, Ltd.: *See*—
Suehisa, Shiro; and Kajiwara, Hideki, 4,545,685, Cl. 366-144.000.
Jourde, Jean-Pierre; Cmapo-Garraza, Pedro; Miettaux, Marc; and Michaux, Thierry, to Regie Nationale des Usines Renault. Electromagnetic control injection systems for diesel engines of the pressure-time type where the injector needle is controlled by the charging and discharging of a chamber. 4,545,352, Cl. 123-447.000.
Judd, Myles A.: *See*—
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.
Juengel, Richard O., to GTE Valeron Corporation. Machine system using infrared telemetering. 4,545,106, Cl. 29-563.000.
Juillard, Yves. Spinning method and apparatus for putting method to use. 4,545,194, Cl. 57-400.000.
Jungesjo, Harald N., to Anderson-Cook, Inc. Rotary forming machine having tie bar connection. 4,545,230, Cl. 72-108.000.
Just, Gunther: *See*—
Diekotter, Friedrich W.; Honges, Edgar; Just, Gunther; Smolka, Heinz-Gerd; and Wust, Willi, 4,545,969, Cl. 423-328.000.
Kabushiki Kaisha Daisei Kikai: *See*—
Chikatani, Hajime, 4,545,185, Cl. 53-583.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Izumi, Asashiro; and Mikami, Yoshiharu, 4,545,630, Cl. 312-285.000.
Kokabu, Rihei, 4,545,446, Cl. 177-108.000.
Naito, Kazufumi, 4,545,445, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Ogasawara, Takaaki; Maruyama, Tokuji; Sato, Masaharu; Hida, Yukio; and Saito, Takashi, 4,546,234, Cl. 219-137.0PS.
Kabushiki Kaisha Machida Seisakusho: *See*—
Sato, Mitsuru, 4,545,369, Cl. 128-4.000.
Kabushiki Kaisha Mikuni Seisakusho: *See*—
Nakajima, Yoshikazu, 4,546,128, Cl. 523-222.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Oguchi, Yukio; and Yasukawa, Kazuyoshi, 4,546,443, Cl. 364-513.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Koto, Haruhiko, 4,546,362, Cl. 346-140.00R.
Sano, Tadashi, 4,545,279, Cl. 84-1.260.
Ushikoshi, Kenichi, 4,545,686, Cl. 368-63.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kawaguchi, Teruhiko; and Ando, Takayuki, 4,545,546, Cl. 242-107.000.
Kabushiki Kaisha Tokyo Keiki: *See*—
Kitada, Toyohiko; and Arioka, Takanori, 4,545,248, Cl. 73-597.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Tanaka, Akira; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,545,193, Cl. 57-261.000.
Kabushiki Kaisha Yakult Honsha: *See*—
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,545,880, Cl. 204-158.00R.
Kachnowski, Thomas A.: *See*—
Buist, Kevin S.; and Kachnowski, Thomas A., 4,545,556, Cl. 248-346.000.
KaDell, Charles W., Jr., to General Dynamics/Pomona Division. Gimbal fixture and assembly method. 4,545,570, Cl. 269-52.000.
Kadono, Motoaki, to Toray Silicone Company, Ltd. Gas pressure operated dispensing container. 4,545,506, Cl. 222-95.000.
Kainmulle, Thomas: *See*—
Breitenfellner, Franz; and Kainmulle, Thomas, 4,546,126, Cl. 523-216.000.
Kajigaya, Shinichi: *See*—
Yamaguchi, Ikutoshi; and Kajigaya, Shinichi, 4,545,316, Cl. 114-219.000.
Kajiwara, Hideki: *See*—
Suehisa, Shiro; and Kajiwara, Hideki, 4,545,685, Cl. 366-144.000.
Kalinowski, Robert E.: *See*—
Graiver, Daniel; and Kalinowski, Robert E., 4,545,914, Cl. 252-511.000.
Kalopissis, Gregoire; Gallien, Jacqueline; Jacquet, Bernard; Bauer, Daniel; and Chalaye, Jean Phillipe, to L'Oreal. Hair-dyeing process involving protection of the scalp. 4,545,978, Cl. 424-10.000.
Kamada, Akio: *See*—
Sasaki, Hiroaki; Nishiyama, Noboru; and Kamada, Akio, 4,546,230, Cl. 219-121.0LD.
Kamatani, Yoshio; and Sakamoto, Takurou, to Takeda Chemical Industries, Ltd. Method for curing polyurethane compounds. 4,546,153, Cl. 525-453.000.
Kamei, Sadao; Ohashi, Yuichi; Ukai, Toshinao; Yamamuro, Kiyohiko; and Takei, Haruo, to Fuji Photo Film Co., Ltd. Silver halide color light-sensitive materials. 4,546,074, Cl. 430-573.000.
Kameya, Kazuo, to Elmec Corporation. Variable delay line. 4,546,332, Cl. 333-139.000.
Kamijo, Yoshimi: *See*—
Kano, Mitsuru; and Kamijo, Yoshimi, 4,545,928, Cl. 252-518.000.
Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,545,915, Cl. 252-515.00R.
Kaminsky, Theo: *See*—
Bellmann, Bernhard G.; Birkner, Horst W.; and Kaminsky, Theo, 4,545,107, Cl. 29-568.000.
Kamishita, Takuzo, to Toko Yakuhin Industry Co., Ltd. Pharmaceutical preparations. 4,545,992, Cl. 514-161.000.
Kamiya, Takashi: *See*—
Machida, Yoshimasa; Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Kitoh, Kyosuke; and Saito, Isao, 4,546,176, Cl. 544-21.000.
Kammerer, Fred R., to Accurate Metal Weather Strip Company. Metal seals for damper blades. 4,545,566, Cl. 251-357.000.
Kane, Brian J., to Metropolitan Furniture Corp. Furniture construction with replaceable elastomeric covering. 4,545,615, Cl. 297-287.000.
Kanemura, Shinji; and Tachikawa, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Anti-slip apparatus for wheeled vehicle. 4,545,455, Cl. 180-197.000.
Kang, Chang E.; Lowry, L. Alan; and Burkum, Merlin E., to Commonwealth Edison Company. Apparatus and method for locating ground faults. 4,546,309, Cl. 324-52.000.
Kano, Mitsuru; and Kamijo, Yoshimi, to Alps Electric Co., Ltd. Paste for forming a transparent, electrically conductive film. 4,545,928, Cl. 252-518.000.
Kansai Paint Co., Ltd.: *See*—
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.
Kanuma, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Priority determination circuit. 4,546,450, Cl. 364-900.000.
Kaputsky, Fedor N.: *See*—
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.
Karl, Heinz-Dietmar: *See*—
Tinebor, Manfred; Matthies, Gustav; and Karl, Heinz-Dietmar, 4,546,301, Cl. 318-798.000.
Karl Schmidt Fabrik fur Giessereibedarf GmbH & Co.: *See*—
Baetz, Wolfgang; Graefer, Albrecht; and Low, Edgar, 4,545,421, Cl. 164-397.000.
Karlberg, Bo I.; and Thelander, Sidsel, to Bifok AB. Process for flow injection extraction. 4,546,088, Cl. 436-178.000.
Karpis, John J. Fluid flow regulator. 4,545,401, Cl. 137-487.000.
Karpitsky, Viktor S.: *See*—
Stepanenko, Alexandr V.; Voitov, Vladimir G.; Klimenkov, Stepan S.; Bartashevich, Svyatoslav A.; and Karpitsky, Viktor S., 4,545,229, Cl. 72-73.000.
Kasagi, Yoshitaka; and Aketagawa, Tokio, to Tokyo Shibaura Denki Kabushiki Kaisha. Circuit arrangement for processing color television signals. 4,546,377, Cl. 358-23.000.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,545,599, Cl. 280-642.000.
Kassai, Kenzou, to Kassai Kabushikikaisha. Connecting structure between push rods and push rod-connecting rod in baby carriage. 4,545,599, Cl. 280-642.000.
Kastan, B. Linn; and Romero, Ysmael E., to Kastan, B. Linn. Bicycle crank bearing assembly. 4,545,691, Cl. 384-458.000.
Kastl, Erna; Ludwig, Klenk; and Faust, Horst, to Hoechst Aktiengesellschaft. Smoke-permeable film of fiber-reinforced regenerated cellulose for producing tubular casings, in particular sausage casings. 4,546,023, Cl. 428-36.000.
Katayama, Kiichiro: *See*—
Uchida, Yukio; Takagi, Kazuhiro; Katayama, Kiichiro; and Kawase, Hisao, 4,546,051, Cl. 428-653.000.
Kato, Kiichi; and Sakamoto, Masaharu, to Olympus Optical Co., Ltd. Optical system for synthesizing plural light beams. 4,545,651, Cl. 350-394.000.
Kato, Norihiko: *See*—
Ohba, Hisao; Shirai, Akira; Kitazumi, Etsuo; and Kato, Norihiko, 4,545,866, Cl. 204-33.000.

Kato, Shogo, to Konishiroku Photo Industry Co., Ltd. Controlling apparatus for paper-feeding drive operated by driving system of optics unit for exposure. 4,545,676, Cl. 355-3.0SH.
Kato, Taizo; and Souchi, Toshiyuki, to Toyoda Gosei Co., Ltd. Equal tension wire winding device. 4,545,548, Cl. 242-156.000.
Kato, Takashi: *See*—
Nakamura, Norihiko; and Kato, Takashi, 4,545,350, Cl. 123-439.000.
Katz, Saul N.; and Skiff, Ronald H., to General Foods Corporation. Multi-phase liquid solvent decaffeination. 4,545,998, Cl. 426-424.000.
Kaufman, Lance R. Circuit package with membrane, containing thermoconductive material, ruptured against a heat sink. 4,546,410, Cl. 361-387.000.
Kaufman, Lance R. Mounting of a compact circuit package to a heat sink or the like. 4,546,411, Cl. 361-387.000.
Kaufman, Robert J.: *See*—
Franz, John E.; and Kaufman, Robert J., 4,545,804, Cl. 71-86.000.
Kawabata, Takashi: *See*—
Sakai, Shinji; and Kawabata, Takashi, 4,545,664, Cl. 354-400.000.
Kawachi, Tatsuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Nuclear magnetic resonance diagnostic apparatus. 4,545,384, Cl. 128-653.000.
Kawaguchi, Hiroshi: *See*—
Konishi, Masataka; Sakai, Fumihide; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,546,084, Cl. 435-253.000.
Kawaguchi, Teruhiko; and Ando, Takayuki, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Webbing tension device. 4,545,546, Cl. 242-107.000.
Kawai, Hisasi: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, 4,546,338, Cl. 335-229.000.
Kawakami, Kazuhiko: *See*—
Nakazawa, Terumi; Minorikawa, Hitoshi; and Kawakami, Kazuhiko, 4,546,412, Cl. 361-395.000.
Kawano, Yukihiro: *See*—
Yamaguti, Terushige; Miki, Toshinori; Mannaka, Toshio; Koyama, Hiroshi; and Kawano, Yukihiro, 4,545,228, Cl. 72-16.000.
Kawasaki Steel Corporation: *See*—
Sasaki, Hiroaki; Nishiyama, Noboru; and Kamada, Akio, 4,546,230, Cl. 219-121.0LD.
Kawase, Hisao: *See*—
Uchida, Yukio; Takagi, Kazuhiro; Katayama, Kiichiro; and Kawase, Hisao, 4,546,051, Cl. 428-653.000.
Kawashima, Isao: *See*—
Yamaguchi, Tokundo; Kimizuka, Masanori; and Kawashima, Isao, 4,545,500, Cl. 220-4.00B.
Kawata, Shigeo: *See*—
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, 4,545,932, Cl. 260-112.50R.
KBL Corporation: *See*—
Zane, Michael S., 4,545,224, Cl. 70-39.000.
Keane, John J.; and Pauze, Denis R., to General Electric Company. Corona-resistant wire enamel compositions and conductors insulated therewith. 4,546,041, Cl. 428-372.000.
Kearns, Patrick J.: *See*—
Mukerjee, Ajit K.; Kearns, Patrick J.; and Rieman, Davis J., 4,545,134, Cl. 34-27.000.
Kearsley, Walter H.; and Wendt, David L., to Canadian Fram Limited. Programmable temperature control system. 4,545,357, Cl. 123-556.000.
Keil, Michael: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; Spiegler, Wolfgang; and Wuerzer, Bruno, 4,545,806, Cl. 71-88.000.
Keil, Rudolf: *See*—
Auracher, Franz; and Keil, Rudolf, 4,545,642, Cl. 350-96.190.
Keller, Bruno: *See*—
Grether, Paul; Brader, Kurt; and Keller, Bruno, 4,545,160, Cl. 52-172.000.
Keller, Gottfried: *See*—
Scheidt, Joachim; and Keller, Gottfried, 4,545,754, Cl. 425-419.000.
Kellershofen, Hans: *See*—
Richter, Uwe; and Kellershofen, Hans, 4,545,317, Cl. 114-222.000.
Kellett, George W., Jr.: *See*—
Smith, James A.; and Kellett, George W., Jr., 4,545,917, Cl. 252-90.000.
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., to Union Oil Company of California. Method for producing needle coke. 4,545,859, Cl. 201-17.000.
Kelley Manufacturing Company: *See*—
Lastinger, Anthony, 4,545,511, Cl. 222-367.000.
Kelly, John A.: *See*—
Lorenc, Walter F.; Kelly, John A.; and Mandel, Frederick S., 4,545,920, Cl. 252-180.000.
Kennett, Leslie P.: *See*—
Gillies, George M.; Kennett, Leslie P.; and Mathews, Clive A., 4,545,764, Cl. 432-115.000.
Kent, Dennis C.: *See*—
McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., 4,546,341, Cl. 337-177.000.
Kent, Thomas A.; and Shaffer, Jesse S., to North American Philips Corporation. Heat dissipation aluminum electrolytic capacitor. 4,546,415, Cl. 361-433.000.
Kent, William C., to AT&T Technologies, Inc. Method and system for soldering insulation coated parts. 4,545,520, Cl. 228-180.100.
Kerekes, Bela, to Egyesult Izzolampa es Villamossagi Rt. Ballast circuits for discharge lamp. 4,546,290, Cl. 315-209.00R.
Kern, Werner, to RCA Corporation. Deposition of borophosphosilicate glass. 4,546,016, Cl. 427-255.300.
Kerstges, Johannes: *See*—
Beelmann, Richard; and Kerstges, Johannes, 4,545,727, Cl. 415-206.000.
Kerzner, Gary D. Indoor mail slot cover to prevent heat loss through mail slots. 4,545,522, Cl. 232-45.000.
Keys, Steven F., to Essex Group, Inc. Felt applicator. 4,545,323, Cl. 118-268.000.
Khan, Mir N.: *See*—
Wong, Carl Y.; Khan, Mir N.; and Mihalik, John A., 4,545,997, Cl. 426-94.000.
Kidoh, Kunizoh; and Ohta, Mitsuru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride resin composition containing glycidyl (meth)acrylate polymer. 4,546,149, Cl. 525-199.000.
Kiehne, Joachim: *See*—
Schroder, Gunter; and Kiehne, Joachim, 4,545,569, Cl. 269-43.000.
Kielmeyer, William H., to Manville Service Corporation. Ceiling insulation system. 4,545,166, Cl. 52-484.000.
Kikuchi, Hisashi: *See*—
Ono, Minoru; Makino, Teruyoshi; and Kikuchi, Hisashi, 4,546,061, Cl. 430-207.000.
Killer, Eric; Scherer, Gunther; and Stucki, Samuel, to BBC Brown, Boveri & Company, Limited. Process for producing an electrically conductive layer on the surface of a solid-body electrolyte, and electrically conductive layer. 4,546,010, Cl. 427-96.000.
Kim, Dong K.: *See*—
Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., 4,545,834, Cl. 156-124.000.
Kim, Douglas S. T. Dancing hula doll. 4,545,775, Cl. 446-299.000.
Kimizuka, Masanori: *See*—
Yamaguchi, Tokundo; Kimizuka, Masanori; and Kawashima, Isao, 4,545,500, Cl. 220-4.00B.
Kimura, Kenji, to Olympus Optical Co., Ltd. Video signal recording apparatus. 4,546,391, Cl. 360-19.100.
Kimura, Masahiro; Hayashi, Yoshitaka; and Yoshida, Ryohei, to Matsushita Electric Industrial Company, Limited. Shredder with increased reversed unlocking torque. 4,545,537, Cl. 241-36.000.
Kimura, Takahiko: *See*—
Takao, Mitsunori; and Kimura, Takahiko, 4,545,355, Cl. 123-489.000.
King, James P., to Pennwalt Corporation. Complex metal chalcogenides. 4,545,973, Cl. 423-512.00R.
King, Patrick D., to Flo-Con Systems, Inc. Valve position indicator and method. 4,545,406, Cl. 137-553.000.
King, Patrick D.: *See*—
Shapland, Earl P.; and King, Patrick D., 4,545,512, Cl. 222-600.000.
King, Timothy W., to Minnesota Mining and Manufacturing Company. Flexible tape having stripes of electrically conductive particles for making multiple connections. 4,546,037, Cl. 428-323.000.
Kinoshita, Masao; Yamanaka, Teruo; Hayakawa, Kizo; and Sugimoto, Takao. Microwave and luminous probe. 4,545,238, Cl. 73-117.300.
Kinoshita, Mitsuo: *See*—
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,546,227, Cl. 219-69.00W.
Kinoshita, Takeshi: *See*—
Itoh, Michio; Tsukamoto, Takehiro; Watanabe, Shuichi; Kinoshita, Takeshi; and Tomita, Seisuke, 4,545,416, Cl. 152-539.000.
Kinoshita, Teruo, to Misawa Homes Co., Ltd. Heat pump system utilizable for air conditioner, water supply apparatus and the like. 4,545,214, Cl. 62-160.000.
Kinsley, John P., to Seaquist Valve Company. Snap action hinge with closed position straight straps. 4,545,495, Cl. 215-235.000.
Kiriake, Masaharu: *See*—
Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,545,551, Cl. 242-35.50A.
Kirkman, David H.; Lowe, Anthony C.; Wood, John C.; and Golledge, Ian, to International Business Machines Corporation. Liquid filled electro-optic display cell with diaphragm seal. 4,545,650, Cl. 350-357.000.
Kirsch, Steven T., to Mouse Systems Corporation. Detector for electro-optical mouse. 4,546,347, Cl. 340-710.000.
Kishi, Hajimu; and Seki, Masaki, to Fanuc Ltd. Method of creating curved surfaces. 4,546,427, Cl. 364-168.000.
Kishida, Kazuo; Sasaki, Isao; and Mukai, Nobuhiro, to Mitsubishi Rayon Co., Ltd. Polymer composition. 4,546,145, Cl. 524-780.000.
Kishimoto, Shinzo; Ohno, Shigeru; and Abe, Akira, to Fuji Photo Film Co., Ltd. Method for processing color photographic light-sensitive material. 4,546,070, Cl. 430-393.000.
Kiss, Ferenc: *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.
Kiss, Lajos: *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.
Kiss, Laszlo : *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.
Kitada, Toyohiko; and Arioka, Takanori, to Kabushiki Kaisha Tokyo Keiki. Ultrasonic thickness gauge. 4,545,248, Cl. 73-597.000.

Kitaguchi, Hiroshi; Itoh, Isamu; Fujiwara, Itsuo; Nozawa, Yasushi; and Kokubo, Tadayoshi, to Fuji Photo Film Co., Ltd. Heat-developable photographic material. 4,546,075, Cl. 430-617.000.

Kitajima, Hisashi: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,545,702, Cl. 405-269.000.

Kitamura, Kouichi: *See*—
Nagano, Mitsuo; Hirai, Koichi; Kitamura, Kouichi; Shinkai, Kenkichi; and Yasuda, Hiroshi, 4,545,942, Cl. 260-465.00D.

Kitamura, Masahiro, to Tachikawa Spring Co., Ltd. Head-rest device. 4,545,618, Cl. 297-410.000.

Kitano, Kyozo: *See*—
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, 4,545,939, Cl. 260-400.000.

Kitazawa, Kiyoshi: *See*—
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Kitazumi, Etsuo: *See*—
Ohba, Hisao; Shirai, Akira; Kitazumi, Etsuo; and Kato, Norihiko, 4,545,866, Cl. 204-33.000.

Kitoh, Kyosuke: *See*—
Machida, Yoshimasa; Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Kitoh, Kyosuke; and Saito, Isao, 4,546,176, Cl. 544-21.000.

Kiuchi, Naoyuki: *See*—
Fujita, Shigeyoshi; Kiuchi, Naoyuki; Sasaki, Tomoyuki; and Fukuhara, Kazuyoshi, 4,545,303, Cl. 104-93.000.

Kjellin, Per G.; and Persson, Carl G. A., to Aktiebolaget Draco. 3,8-Dialkylxanthines. 4,546,182, Cl. 544-273.000.

Klaassen, Francois M.: *See*—
Maas, Henricus G. R.; Klaassen, Francois M.; and Appels, Johannes A., 4,545,110, Cl. 29-571.000.

Klauer Manufacturing Company: *See*—
Kutsch, Harold G.; and Ehrlich, Earl A., 4,545,291, Cl. 98-42.00A.

Kleber, Heinrich: *See*—
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Kleefisch, Blaise H.: *See*—
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,545,411, Cl. 141-91.000.

Kleefstra, Meindert J., to U.S. Philips Corporation. X-Ray analysis apparatus with pulse amplitude shift correction. 4,546,488, Cl. 378-49.000.

Klein, Joseph T.: *See*—
Effland, Richard C.; and Klein, Joseph T., 4,546,105, Cl. 514-334.000.

Klimenkov, Stepan S.: *See*—
Stepanenko, Alexandr V.; Voitov, Vladimir G.; Klimenkov, Stepan S.; Bartashevich, Svyatoslav A.; and Karpitsky, Viktor S., 4,545,229, Cl. 72-73.000.

Klinner, Wilfred E., to National Research Development Corporation. Crop engaging device and method. 4,545,188, Cl. 56-364.000.

Klippert, Heinz: *See*—
Engelmann, Manfred; Piewan, Otto; Kraus, Helmut; and Klippert, Heinz, 4,546,135, Cl. 524-158.000.

Klisky, Jan: *See*—
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

Klopach, Robert T.: *See*—
Laughon, Thomas C.; Haynes, H. Taylor; Klopach, Robert T.; and Warner, Richard C., 4,546,357, Cl. 343-702.000.

Klusmier, Kenneth L., to Morgan Construction Company. Apparatus for assembling elongated elements. 4,545,724, Cl. 414-745.000.

Klussmann, Udo: *See*—
Manecke, Georg; and Klussmann, Udo, 4,546,078, Cl. 435-52.000.

Klygis, Mindaugas J., to Illinois Tool Works Inc. Bottle multi-package and multi-packaging device. 4,545,480, Cl. 206-151.000.

Knapp, Philip B. Liquid metering and dispensing apparatus. 4,545,535, Cl. 239-313.000.

Knight, Alan C., to Du Pont de Nemours, E. I., and Company. Coating compositions of tetrafluoroethylene aqueous dispersions. 4,546,144, Cl. 524-546.000.

Knochel, Reinhard, to U.S. Philips Corporation. Arrangement for measuring moisture content. 4,546,311, Cl. 324-58.50R.

Knoedler, Roy E.: *See*—
Martel, Lisa; Knoedler, Roy E.; and Gerken, Donald L., 4,545,613, Cl. 297-250.000.

Knoll, Glenn F.; and Schrader, Mark E., to Medtronic, Inc. Energy window selection for a radiation signal processing system. 4,546,255, Cl. 250-369.000.

Knop, Karl H., to RCA Corporation. Solid-state color-encoding television camera. 4,546,380, Cl. 358-43.000.

Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, to Vyskummy ustav chemickych claken. Cigarette filter and method of manufacture. 4,546,040, Cl. 428-370.000.

Knotz, Florian: *See*—
Pyne, William J.; Lowbridge, John; Chang, In-Kook; Knotz, Florian; and Powers, Larry J., 4,545,810, Cl. 71-92.000.

Ko, Ming; Oxsen, Michael E.; and Prime, Robert B., to International Business Machines Corporation. Polymeric additives for magnetic coating materials. 4,546,035, Cl. 428-315.900.

Kobashi, Toshiyuki; and Naka, Hideo, to Japan Exlan Company, Ltd. Process for producing dispersions comprising fine particles of acrylonitrile polymers. 4,546,146, Cl. 524-831.000.

Kobashi, Yuuji: *See*—
Yogome, Yoshihiro; Kobashi, Yuuji; and Shinada, Kazuyoshi, 4,545,469, Cl. 192-51.000.

Kobayashi, Michio, to Jidosha Kiki Co., Ltd. Apparatus for clearance adjustment in brake booster. 4,545,206, Cl. 60-554.000.

Kobayashi, Waichi; Yoshida, Kozaburo; and Igarashi, Hideaki, to UBE Industries, Ltd. Process and apparatus for producing a high purity magnesia fine powder. 4,545,975, Cl. 423-636.000.

Koch, Gerhard, to Hafele KG. Connector for detachable connection of components of furniture or the like at right angles to each other. 4,545,698, Cl. 403-231.000.

Koch, Mark B. Adjustable arm member for use with a lamp or the like. 4,545,555, Cl. 248-280.100.

Kodama, Naoki: *See*—
Suzuki, Ryo; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,546,452, Cl. 365-36.000.

Koelmel, Donald F.; Jamiolkowski, Dennis D.; Shalaby, Shalaby W.; and Bezwada, Rao S., to Ethicon, Inc. Poly(p-dioxanone) polymers having improved radiation resistance. 4,546,152, Cl. 525-437.000.

Kohler, Alfred; and Krizek, Oldrich, to ITT Industries, Inc. Windshield wiper installation. 4,545,088, Cl. 15-250.350.

Kohyama, Katsuhisa; Matsuno, Akira; and Tsuruhara, Kenji, to Mitsubishi Chemical Industries Ltd. Process for producing polycarbonate resin particles. 4,546,172, Cl. 528-491.000.

Koishi, Kenji; Yoshida, Tomio; Satoh, Isao; and Ohara, Shunji, to Matsushita Electric Industrial Co., Ltd. Optical data recording and reproducing apparatus. 4,546,462, Cl. 369-53.000.

Koivula, Jorma, to Oy Tampella AB. Cog-belt-driven, noise-suppressed power transmission device. 4,545,778, Cl. 474-153.000.

Kokabu, Rihei, to Kabushiki Kaisha Ishida Koki Seisakusho. Hopper in combinatorial weighing apparatus. 4,545,446, Cl. 177-108.000.

Kokado, Masayuki: *See*—
Suzuki, Hirokazu; and Kokado, Masayuki, 4,546,272, Cl. 307-455.000.

Kokubo, Tadayoshi: *See*—
Kitaguchi, Hiroshi; Itoh, Isamu; Fujiwara, Itsuo; Nozawa, Yasushi; and Kokubo, Tadayoshi, 4,546,075, Cl. 430-617.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Matsumoto, Shuichi; Hatori, Yoshinori; Murakami, Hitomi; and Yamamoto, Hideo, 4,546,386, Cl. 358-136.000.

Kolb, William F. Paint roller apparatus with inherent cleaning capability. 4,545,395, Cl. 134-115.00R.

Kolitsky, Norman: *See*—
Barchechat, Shlomo; and Kolitsky, Norman, 4,545,363, Cl. 126-285.00B.

Kolter, Martin, to Hilti Aktiengesellschaft. Device for melting and dispensing a thermoplastic adhesive. 4,546,235, Cl. 219-230.000.

Komar, Valentina V.: *See*—
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.

Komatsu, Isamu; Anzai, Masayasu; Hoshi, Nobuyoshi; and Akimaru, Susumu, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Developing apparatus. 4,545,325, Cl. 118-645.000.

Komiyama, Makoto: *See*—
Hirai, Hidefumi; Komiyama, Makoto; and Hara, Susumu, 4,546,094, Cl. 502-402.000.

Komura, Ichiroh: *See*—
Uchida, Kuniharu; Nagai, Satoshi; and Komura, Ichiroh, 4,545,251, Cl. 73-631.000.

Komuro, Yoshiyuki: *See*—
Gotah, Eizo; Tomishima, Takeshi; Tsutsumi, Tadao; and Komuro, Yoshiyuki, 4,546,171, Cl. 528-310.000.

Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, to Sumitomo Chemical Company, Limited. Diphenyl sulfone compounds, and their production and use. 4,545,812, Cl. 71-103.000.

Konishi, Masahiro; and Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Combination still and motion picture electronic camera/-recorder. 4,546,390, Cl. 360-10.300.

Konishi, Masataka; Sakai, Fumihide; Miyaki, Takeo; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Biologically pure culture of Actinomadura Sp. 4,546,084, Cl. 435-253.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Asano, Masao; Sunaga, Tetsuro; Murata, Hideki; and Matsumoto, Kazumasa, 4,546,044, Cl. 428-413.000.
Hamaguchi, Takehiko; Hazama, Kiyoaki; Iwaida, Kenichi; and Iguchi, Takeyoshi, 4,545,661, Cl. 354-86.000.
Kato, Shogo, 4,545,676, Cl. 355-3.0SH.
Kuse, Satoru, 4,546,068, Cl. 430-375.000.

Kononowicz, Halina M.: *See*—
Janick, Jules; and Kononowicz, Halina M., 4,545,147, Cl. 47-58.000.

Kopp, Richard: *See*—
Grogler, Gerhard; Hess, Heinrich; and Kopp, Richard, 4,546,165, Cl. 528-53.000.

Koppers Company, Inc.: *See*—
Prew, Stanley R., 4,545,538, Cl. 241-73.000.

Kosa, David R.: *See*—
Lyons, George A.; and Kosa, David R., 4,545,337, Cl. 123-80.0BA.

Koshevar, Vasily D.: *See*—
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.

Kosson, Robert: *See*—
Alario, Joseph P.; Kosson, Robert; and Leszak, Edward, 4,545,427, Cl. 165-104.260.
Kostov, Georgi T.: *See*—
Marinov, Mihail T.; Petkanchin, Lyubomir T.; Pushev, Georgi I.; Kostov, Georgi T.; Mihovski, Mitko M.; and Manolova, Valentina A., 4,545,252, Cl. 73-633.000.
Kosuda, Tooru: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, 4,546,338, Cl. 335-229.000.
Koto, Haruhiko, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Low voltage ink-jet printhead. 4,546,362, Cl. 346-140.00R.
Kouda, Fumio: *See*—
Morita, Shigeki; Masai, Tadahisa; Nakashita, Shigeto; Uemura, Toshio; Kouda, Fumio; and Nawata, Tsuyoshi, 4,545,307, Cl. 110-264.000.
Kovacs, Robert J.: *See*—
Gerber, James E.; Kovacs, Robert J.; and Herrmann, Willy, 4,545,605, Cl. 285-189.000.
Kowalski, David J.: *See*—
Fong, Dodd W.; and Kowalski, David J., 4,546,156, Cl. 526-240.000.
Kowalski, Gunter, to U.S. Philips Corporation. Test method for workpieces. 4,546,384, Cl. 358-107.000.
Kowalski, Michael S., to Guilford Kapwood Limited. Simulated cashmere fabric and method. 4,546,026, Cl. 428-91.000.
Kowalsky, Martin L., to Autodynamics Corporation of America. Method of making bright-faced reinforced plastic bumper. 4,545,105, Cl. 29-469.500.
Koyama, Hiroshi: *See*—
Yamaguti, Terushige; Miki, Toshinori; Mannaka, Toshio; Koyama, Hiroshi; and Kawano, Yukihiro, 4,545,228, Cl. 72-16.000.
Koyama, Masaaki: *See*—
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Koyama, Tamotsu: *See*—
Sasaki, Takehiko; and Koyama, Tamotsu, 4,545,647, Cl. 350-331.00R.
Kozyrski, Vincent T., to Fletcher-Terry Corporation. Sheet cutting machine. 4,545,515, Cl. 225-96.500.
Kraft, Inc.: *See*—
Cribb, B. Jay, Jr.; Drozd, Edward J., Jr.; Wilmot, Ian R.; and Leap, Debradell C., 4,545,508, Cl. 222-153.000.
Kraus, Charles J.: *See*—
Feinberg, Irving; Kraus, Charles J.; and Stoller, Herbert I., 4,546,413, Cl. 361-410.000.
Kraus, George A., to Iowa State University Research Foundation, Inc. Amidoalkylation reactions of anilines. 4,545,935, Cl. 260-245.700.
Kraus, Helmut: *See*—
Engelmann, Manfred; Plewan, Otto; Kraus, Helmut; and Klippert, Heinz, 4,546,135, Cl. 524-158.000.
Kraus, Richard B.: *See*—
Musschoot, Albert; and Kraus, Richard B., 4,545,509, Cl. 222-198.000.
Krauss, Olaf: *See*—
Schweiki, Ludwig; and Krauss, Olaf, 4,545,791, Cl. 55-182.000.
Krijgsman, Pieter. Method for the formation of calcium silicate and the resulting structure. 4,545,970, Cl. 423-331.000.
Krijl, Gerrit; and Van de Leest, Renaat E., to U.S. Philips Corporation. Method of making an article having a layer of a nickel-phosphorus alloy and coated with a protective layer. 4,545,871, Cl. 204-56.00R.
Kriz, Jaroslav F.: *See*—
Wan, Jeffrey K. S.; and Kriz, Jaroslav F., 4,545,879, Cl. 204-158.00R.
Krizek, Oldrich: *See*—
Kohler, Alfred; and Krizek, Oldrich, 4,545,088, Cl. 15-250.350.
Krosoczka, Joseph D.; and Cervini, Carl. Valve. 4,545,564, Cl. 251-315.000.
Krueger, Leland R.: *See*—
Miller, David A.; Krueger, Leland R.; and Charlton, Richard J., 4,545,153, Cl. 51-118.000.
Krupp Polysius AG: *See*—
Heinemann, Otto, 4,545,704, Cl. 406-32.000.
Kubach, Hans, to Robert Bosch GmbH. Pole structure for a polarized electromagnet. 4,546,339, Cl. 335-230.000.
Kubach, Hans: *See*—
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,545,353, Cl. 123-454.000.
Kubo, Hiroshi: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,545,809, Cl. 71-92.000.
Kubota, Ltd.: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,545,453, Cl. 180-131.000.
Kuchuris, George F., to Singer Company, The. Electrical coil assembly. 4,546,340, Cl. 336-192.000.
Kuhn, Friedhelm, to Ruhrgas Aktiengesellschaft. Method of operating an industrial furnace. 4,545,208, Cl. 60-648.000.
Kuhn, Werner H.: *See*—
Swinehart, Steven L.; and Kuhn, Werner H., 4,545,659, Cl. 352-216.000.
Kuhnke, Hermann; and Rattner, Manfred, to Siemens Aktiengesellschaft. Single tank X-ray diagnostic generator. 4,546,489, Cl. 378-103.000.
Kumura, Haruyoshi: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,545,265, Cl. 74-868.000.
Kuno, Hiroaki: *See*—
Tamura, Takahiro; Kuno, Hiroaki; Uchikawa, Naoshi; Murayama, Akira; and Mizuno, Takao, 4,545,747, Cl. 418-55.000.
Kunz, Peter, to Mettler Instrumente AG. Weighing apparatus including improved yoke construction. 4,545,448, Cl. 177-212.000.
Kunz, Robert A., to Du Pont de Nemours, E. I., and Company. Process for preparing sulfonylureas. 4,546,179, Cl. 544-206.000.
Kuper, Hans-Heinrich: *See*—
Biewald, Heinz; Gronebaum, Theo; and Kuper, Hans-Heinrich, 4,545,845, Cl. 156-544.000.
Kurata, Masami; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Multifunction copying machine. 4,546,381, Cl. 358-78.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kidoh, Kunizoh; and Ohta, Mitsuru, 4,546,149, Cl. 525-199.000.
Mizuno, Toshiya; and Murayama, Naohiro, 4,546,158, Cl. 526-255.000.
Kurjan, Janet; and Herskowitz, Ira, to Univ. of California, Regents of the. *E. coli/Saccharomyces cerevisiae* plasmid cloning vector containing the alpha-factor gene for secretion and processing of hybrid proteins. 4,546,082, Cl. 435-172.300.
Kuroda, Tsuyoshi: *See*—
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, 4,546,107, Cl. 514-411.000.
Kurokawa, Eiki: *See*—
Cutkosky, Mark R.; and Kurokawa, Eiki, 4,545,722, Cl. 414-730.000.
Kuroki, Yoichi; Yoshinari, Yukihiro; and Hiraga, Ryozo, to Canon Kabushiki Kaisha. Alignment mark detecting apparatus and method. 4,545,684, Cl. 356-400.000.
Kurosaki, Teikichi: *See*—
Okamoto, Kaoru; Hamada, Masaki; and Kurosaki, Teikichi, 4,545,993, Cl. 514-456.000.
Kurosawa, Yukio: *See*—
Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, 4,546,222, Cl. 200-144.00B.
Kurth, Duane G.: *See*—
Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., 4,546,430, Cl. 364-200.000.
Kusanagi, Tadashi: *See*—
Yoshino, Souichi; Kusanagi, Tadashi; and Mori, Masakazu, 4,546,409, Cl. 361-387.000.
Kuse, Satoru, to Konishiroku Photo Industry Co., Ltd. Method for processing of light-sensitive silver halide color photographic material. 4,546,068, Cl. 430-375.000.
Kutsch, Harold G.; and Ehrlich, Earl A., to Klauer Manufacturing Company. Roofline ventilators. 4,545,291, Cl. 98-42.00A.
Kuwabara, Hirofumi: *See*—
Tsuchiya, Masahiko; and Kuwabara, Hirofumi, 4,546,253, Cl. 250-288.000.
Kuze, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ornamental composite of a metal alloy surrounding a mineral powder core for use in spectacle frames. 4,546,049, Cl. 428-621.000.
Kwasnik, Andrew F.: *See*—
Covell, Russell B.; and Kwasnik, Andrew F., 4,545,330, Cl. 122-392.000.
L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques: *See*—
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La Telemecanique Electrique: *See*—
Verdenne, Serge; Brocard, Didier; Hardouin, Pierre; and Lameyre, Felix, 4,545,697, Cl. 403-230.000.
LaBelle, Charles E., to Thomas Industries, Inc. Multi-position relief valve. 4,545,405, Cl. 137-524.000.
Laboratoire L. Lafon: *See*—
Lafon, Louis, 4,545,996, Cl. 514-629.000.
Lade, Robert W.: *See*—
Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., 4,546,367, Cl. 357-23.400.
Lafon, Louis, to Laboratoire L. Lafon. N-(4-Acetylaminophenacyl)amine derivatives useful as pharmaceuticals. 4,545,996, Cl. 514-629.000.
Laghi, Aldo A., to General Electric Company. Method for molding a liquid injection molding composition. 4,545,952, Cl. 264-328.200.
LaHann, Thomas R.; and Farmer, Ralph W., to Procter & Gamble Company, The. Method for preventing or reducing dipilatory irritation. 4,546,112, Cl. 514-627.000.
Laing, Graham S., to Northern Telecom Limited. Line use indicator for telephone sets sharing a single line. 4,546,214, Cl. 179-81.00C.
Laitar, Robert A.; and Gomez, Eduardo, to Acme Resin Corporation. Polyurethane binder compositions. 4,546,124, Cl. 523-143.000.
Lake, William R., to Ford Motor Company. Four-wheel drive axleshaft clutch mechanism. 4,545,456, Cl. 180-233.000.
Lakes, Sherman, to Day Star Concepts. Coated, heat shrinkable expanded polystyrene. 4,546,134, Cl. 524-141.000.
Lakritz, Mark N.; Ordonez, Jose; and Tubiola, Peter J., to International Business Machines Corporation. Method for forming elongated solder connections between a semiconductor device and a supporting substrate. 4,545,610, Cl. 29-589.000.
Lambert, Robert L.; Nagel, Judy A.; and Bergamo, Robert L., to North American Philips Corporation. Positive-working photoresist composition and method for forming a light-absorbing matrix. 4,546,064, Cl. 430-270.000.

Lameyre, Felix: *See—*
Verdenne, Serge; Brocard, Didier; Hardouin, Pierre; and Lameyre, Felix, 4,545,697, Cl. 403-230.000.

Lammler, Bernhard: *See—*
Bosshard, Andreas; and Lammler, Bernhard, 4,545,637, Cl. 339-177.00E.

Landgraf, Scott. Apparatus for harvesting fruit or nuts. 4,545,187, Cl. 56-329.000.

Landstingens Inkopscentral LIC: *See—*
Feldt, Mats, 4,545,085, Cl. 5-81.00R.

Lang, John G., to Rotesco Limited. Magnetic testing device for supported objects. 4,546,316, Cl. 324-262.000.

Lange, Russell C.: *See—*
Field, Cheryl B.; and Lange, Russell C., 4,546,066, Cl. 430-314.000.

Lange, Wolfgang, to Akzona Incorporated. Process for the manufacture of flame-resistant and hydrophilic polyester fibers. 4,545,949, Cl. 264-170.000.

Langham, J. Michael: *See—*
Sellett, Andrew J.; and Langham, J. Michael, 4,545,439, Cl. 172-430.000.

Langner, Carl G., to Shell Oil Company. Under ice pipelay apparatus and method. 4,545,139, Cl. 37-197.000.

LaRocca, William J.: *See—*
Fernandez, John E.; and LaRocca, William J., 4,545,467, Cl. 192-4.00A.

Larriere, Jean-Francois: *See—*
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Larsen, Robert H.: *See—*
Giaimo, Anthony; Larsen, Robert H.; and Rodda, Donald, 4,545,311, Cl. 112-254.000.

Lastinger, Anthony, to Kelley Manufacturing Company. Peanut seed meter. 4,545,511, Cl. 222-367.000.

Latham, Robert: *See—*
Naylor, Michael; and Latham, Robert, 4,546,470, Cl. 370-97.000.

Latino, Richard M.; and Crabbe, David K. Wrist support for use with an office machine having a keyboard. 4,545,554, Cl. 248-118.100.

Lato, Stephen M., to Stauffer Chemical Company. Removal of organic residue from fiber mist eliminator. 4,545,789, Cl. 55-71.000.

Lau, Chi K., to Texas Instruments Incorporated. Method of forming a titanium disilicide. 4,545,116, Cl. 29-591.000.

Laughon, Thomas C.; Haynes, H. Taylor; Klopach, Robert T.; and Warner, Richard C., to Singer Company, The. Furniture antenna system. 4,546,357, Cl. 343-702.000.

Lauritzen, Nels J., to Johnson & Johnson Products, Inc. Unitary adhesive bandage and package. 4,545,372, Cl. 128-156.000.

Lave, Daniel: *See—*
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Lavering, Gordon R.: *See—*
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Law, Nin Y., to Soma Traders Ltd. Steering mechanism for self-powered vehicles and vehicles employing said steering mechanism. 4,545,776, Cl. 446-443.000.

Lawing, Stephen E.: *See—*
Allred, Neal C., III, 4,545,338, Cl. 123-90.150.

Lawless, William N.; and Clark, C. Frederick, Jr., to CeramPhysics, Inc. Materials and methods for pressure and temperature sensors at cryogenic temperatures. 4,545,254, Cl. 73-714.000.

Leap, Debradell C.: *See—*
Cribb, B. Jay, Jr.; Drozd, Edward J., Jr.; Wilmot, Ian R.; and Leap, Debradell C., 4,545,508, Cl. 222-153.000.

LeaRonal, Inc.: *See—*
Martin, James L.; McCaskie, John E.; and Toben, Michael P., 4,545,868, Cl. 204-47.000.

Leary, James J., to C. R. Bard, Inc. Steerable guide wire for balloon dilatation procedure. 4,545,390, Cl. 128-772.000.

Le Barny, Pierre: *See—*
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LeBlanc, Robert A.: *See—*
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LeBourg, Michel: *See—*
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Lecerf, Andre : *See—*
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Lee, Kenneth R.: *See—*
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,546,404, Cl. 361-331.000.

Le Foyer de Costil, Carol; Ayache, Liliane; and Tisseyre, Jean-Paul, to L'Oreal. Anti-acne composition. 4,545,990, Cl. 514-557.000.

Legroux, Didier: *See—*
Bondiou, Jean-Claude; Hodac, Francoise; and Legroux, Didier, 4,546,185, Cl. 546-133.000.

Lehmann, Jean-Marc; Soboul, Raymond; and Macaire, Marcel, to Merlin Gerin. Draw-out switchgear having improved disconnect contacts. 4,546,221, Cl. 200-50.0AA.

Lehoczky, Sandor L.; and Szofran, Frank R., to McDonnell Douglas Corporation. HCT Crystal growth method. 4,545,848, Cl. 156-616.00R.

Leiber, Heinz, to Robert Bosch GmbH. Apparatus for ascertaining the adhesion factor of a road surface. 4,545,240, Cl. 73-146.000.

Leland Stanford Junior University, The Board of Trustees of The: *See—*
Shaw, Herbert J.; and Chodorow, Marvin, 4,546,476, Cl. 372-6.000.

Lemaire, Marc; and Le Roc'h, Roland, to Brissonneau et Lotz Marine. Machine to apply a screwing or unscrewing torque. 4,545,269, Cl. 81-57.340.

Lenin Kohaszati Muvek: *See—*
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.

Leone, Gino L., to Alcan International Limited. Metal pretreatment for resistance spot welding of aluminum. 4,546,229, Cl. 219-118.000.

Le Roc'h, Roland: *See—*
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Les Cables de Lyon: *See—*
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Leshik, Richard R.; Swallow, Nancy A.; Leusner, Steven J.; and DiGiovacchino, David J., to General Foods Corporation. Cold-water-soluble gelatin powders. 4,546,002, Cl. 426-576.000.

Leszak, Edward: *See—*
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Letellier, Philippe: *See—*
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Letsche, Ulrich: *See—*
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Leusner, Steven J.: *See—*
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Leutgob, Alois: *See—*
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Lever Brothers Company: *See—*
Izzo, Henry J.; and McNaught, John P., 4,546,003, Cl. 426-581.000.

Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides, compositions and use. 4,545,808, Cl. 71-92.000.

Lewiner, Jacques; Perino, Didier; and Hennion, Claude. Devices for measuring ionizing radiations. 4,546,257, Cl. 250-388.000.

Lewis, Brett; and Fellner, Van N. Flag raising device for water skiing. 4,545,320, Cl. 116-28.00R.

Lewis, Paul J. S.: *See—*
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,545,909, Cl. 210-618.000.

Lewtas, Kenneth: *See—*
Rossi, Albert; Rehrer, David H.; Oswald, Alexis A.; Lewtas, Kenneth; and Tack, Robert D., 4,546,137, Cl. 524-217.000.

Li, Ying H.; and Bonnecaze, Bernard F., to Atlantic Richfield Company. Method for staged cooling of particulate solids. 4,545,132, Cl. 34-20.000.

Libicky, Arnost; and Schar, Meinrad, to Ciba-Geigy AG. Method for processing photographic silver dye bleach materials. 4,546,069, Cl. 430-390.000.

Licentia Patent-Verwaltungs-GmbH: *See—*
Christmann, Burkhard; Weber, Jorg; and Stadtfeld, Gerhard, 4,545,420, Cl. 164-150.000.

Lidster, Daniel K. Method of making a set of marimba mallets. 4,545,836, Cl. 156-185.000.

Lieberman, Walter G., to Tol-O-Matic, Inc. Pressure cylinder. 4,545,290, Cl. 92-88.000.

Liescheidt, Duane B.: *See—*
Rogers, William R.; and Liescheidt, Duane B., 4,545,125, Cl. 33-572.000.

Light Signatures, Inc.: *See—*
Goldman, Robert N., 4,546,352, Cl. 340-825.340.

Ligthart, Franciscus A. S.: *See—*
Heuvelmans, Jean J.; Couwenberg, Winston D.; and Ligthart, Franciscus A. S., 4,546,285, Cl. 313-25.000.

Lillibridge, Harold R.; and Russo, Joseph D., to Champion International Corporation. Envelope gumbox friction brake and safety slip clutch. 4,545,846, Cl. 156-578.000.

Lilliwyte Societe Anonyme: *See—*
Coetzer, Johan; Galloway, Roy C.; Bones, Roger J.; Teagle, David A.; and Moseley, Patrick T., 4,546,055, Cl. 429-103.000.

Lin, Chinlon: *See—*
Beni, Gerardo; Bridges, Thomas J.; Hackwood, Susan; and Lin, Chinlon, 4,545,713, Cl. 414-1.000.

Lin, Trong G.: *See—*
Chang, Kong R.; and Lin, Trong G., 4,546,093, Cl. 502-324.000.

Lin, Yang-i: *See—*
Hlavka, Joseph J.; Bitha, Panayota; and Lin, Yang-i, 4,546,181, Cl. 544-225.000.

Lindahl, Gerald: *See—*
Cooper, Ellis; and Lindahl, Gerald, 4,546,245, Cl. 250-211.00K.

Lindauer Dornier Gesellschaft mbH: *See—*
Tovenrath, Claus; and Tovenrath, Frank, 4,545,099, Cl. 28-202.000.

Lindbloom, Eric: *See—*
Eichelberger, Edward B.; and Lindbloom, Eric, 4,546,473, Cl. 371-25.000.

Linde Aktiengesellschaft: *See—*
Backe, Wolfgang; Weingarten, Franz; and Murrenhoff, Hubertus, 4,545,201, Cl. 60-420.000.
Deininger, Horst; and Stuermer, Burkhard, 4,545,203, Cl. 60-468.000.

Lindholm, Edward P.: *See*—
Bronstein-Bonte, Irena Y.; and Lindholm, Edward P., 4,546,062, Cl. 430-215.000.
Lindmark, Gunnar: *See*—
Sundberg, Ake; and Lindmark, Gunnar, 4,545,413, Cl. 144-176.000.
Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., to Goodyear Tire & Rubber Company, The. Pneumatic tire tread. 4,545,415, Cl. 152-209.00R.
Lingscheit, James N.: *See*—
Amberger, Charles J.; and Lingscheit, James N., 4,546,050, Cl. 428-630.000.
Linton, David J., to Sundstrand Corporation. Pressure-regulating system. 4,545,202, Cl. 60-420.000.
Lion Corporation: *See*—
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, 4,545,939, Cl. 260-400.000.
List, John F.; and Nunn, William M., III, to Fleming Steel Company. Locking device for center fold hangar door. 4,545,418, Cl. 160-213.000.
Liu, Yu-Nan; and Pervier, James W., to Air Products and Chemicals, Inc. Dual mixed refrigerant natural gas liquefaction. 4,545,795, Cl. 62-11.000.
Liu, Yung H. Apparatus for peeling and twisting an electric wire having an insulating coating. 4,545,195, Cl. 57-22.000.
Llewellyn, William D., to National Semiconductor Corporation. NPN Transistor current mirror circuit. 4,546,307, Cl. 323-315.000.
LMT-Radio Professionnelle: *See*—
Petitjean, Christian; and Parquier, Guy L., 4,546,356, Cl. 343-18.00E.
Loeffler, Ronald L.: *See*—
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Lof Plastics Inc.: *See*—
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Loffet, Albert: *See*—
Degelaen, Jacques; Loffet, Albert; and Durieux, Jean-Pierre, 4,546,076, Cl. 435-24.000.
Long, John V.: *See*—
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Lonza Ltd.: *See*—
Previdoli, Felix; and Tenud, Leander, 4,545,934, Cl. 260-239.00E.
Loontjens, Jacobus A.; and Muskens, Bernardus J., to Stamicarbon B.V., Licensing Subsidiary of DSM. Process of preparing a solid catalytic titanium component and process for the polymerization of 1-alkenes using such a titanium component. 4,546,092, Cl. 502-105.000.
Lopiccolo, Mario T., to United Technologies Corporation. Optical encoder using time domain and wavelength multiplexing. 4,546,466, Cl. 370-3.000.
Lord, Richard G., to Carrier Corporation. Electronic program control for a refrigeration unit. 4,545,210, Cl. 62-77.000.
L'Oreal: *See*—
Brun, Alain M.; Marcotte, Louis; and Mellul, Myriam, 4,546,312, Cl. 324-61.00P.
Gueret, Jean-Louis H.; and Arraudeau, Jean-Pierre, 4,545,393, Cl. 132-88.500.
Jacquet, Bernard; Papantoniou, Christos; and Gaetani, Quintino, 4,545,981, Cl. 424-61.000.
Kalopissis, Gregoire; Gallien, Jacqueline; Jacquet, Bernard; Bauer, Daniel; and Chalaye, Jean Phillipe, 4,545,978, Cl. 424-10.000.
Le Foyer de Costil, Carol; Ayache, Liliane; and Tisseyre, Jean-Paul, 4,545,990, Cl. 514-557.000.
Loreck, Heinz: *See*—
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Lorenc, Walter F.; Kelly, John A.; and Mandel, Frederick S., to Nalco Chemical Company. Boiler water treating compositions. 4,545,920, Cl. 252-180.000.
Lovell, Roger. Corrosion protection method. 4,546,015, Cl. 427-247.000.
Low, Edgar: *See*—
Baetz, Wolfgang; Graefer, Albrecht; and Low, Edgar, 4,545,421, Cl. 164-397.000.
Low, Martin: *See*—
Rebsamen, August; and Low, Martin, 4,545,179, Cl. 53-443.000.
Lowbridge, John: *See*—
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Lowe, Anthony C.: *See*—
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Lowery, Michael K.: *See*—
Radovich, David A.; and Lowery, Michael K., 4,546,122, Cl. 521-164.000.
Lowry, L. Alan: *See*—
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LTV Aerospace and Defense: *See*—
Sobey, Arthur E., Jr., 4,545,641, Cl. 350-1.100.
Lubke, Wilfried, to Siemens Aktiengesellschaft. Liquid ring vacuum pump for gaseous media. 4,545,730, Cl. 417-68.000.
Ludwig, Klenk: *See*—
Kastl, Erna; Ludwig, Klenk; and Faust, Horst, 4,546,023, Cl. 428-36.000.
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; Zajicek, Ernst; and Puhringer, Othmar, to Voest-Alpine Aktiengesellschaft. Plasma melting furnace arrangement. 4,546,483, Cl. 373-24.000.
Luhmer, Horst, to Integral Hydraulik & Co. Electrohydraulic, two-stage, proportional displacement valve. 4,545,409, Cl. 137-625.640.
Luke, Floyd L.; and Luke, Mark C. Trailer coupler. 4,545,596, Cl. 280-509.000.
Luke, Mark C.: *See*—
Luke, Floyd L.; and Luke, Mark C., 4,545,596, Cl. 280-509.000.
Lumma, William C., Jr.; and Wohl, Ronald A., to Schering A.G. Substituted phenylalkenyl ammonium salts as antiarrhythimc agents. 4,545,995, Cl. 514-523.000.
Lummus Crest, Inc.: *See*—
Schindler, Harvey D.; and Chen, James M., 4,545,890, Cl. 208-8.0LE.
Lunt, James; MacPherson, Edwin J.; and Meunier, Paul J., to Fiberglas Canada, Inc. Closed cell phenolic foam. 4,546,119, Cl. 521-131.000.
Lupke, Manfred A. A. Apparatus for molding of plastic tubing. 4,545,751, Cl. 425-72.00R.
Lusas, E. W.: *See*—
Rhee, Khee C.; and Lusas, E. W., 4,546,004, Cl. 426-656.000.
Luscher, Rene , to Gretag Aktiengesellschaft. Transport device for disk shaped print masters. 4,545,675, Cl. 355-76.000.
Luteri, George F.; Stach, Leonard J.; and Nickell, Louis G., to Velsicol Chemical Corporation. 3-Chlorobenzyl-3,6-dichloro-2-methoxybenzoate. 4,546,196, Cl. 560-65.000.
Luteri, George F.: *See*—
Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., 4,545,813, Cl. 71-107.000.
Lyons, George A.; and Kosa, David R. Rotary valve engine. 4,545,337, Cl. 123-80.0BA.
Lyons, Michael D., to American Standard Inc. Pressure-regulating valve with a force-feedback. 4,545,402, Cl. 137-495.000.
Lyskawa, Edmond; Roger, Paul; Marquis, Jean; and Canivez, Etienne, to Entreprise Lyskawa S.A.; Union Siderurgique du Nord et de L'est da la France (USINOR) S.A.; and Etudes Techniques et Realisations (CdF Ingenierie) S.A. Battery of coke ovens and a method for repairing them. 4,545,860, Cl. 201-41.000.
Maag Gear-Wheel and Machine Company Limited: *See*—
Bloch, Peter; Donner, Meinrad; and Schwaighofer, Roman, 4,545,151, Cl. 51-52.00R.
Maas, Henricus G. R.; Klaassen, Francois M.; and Appels, Johannes A., to U.S. Philips Corporation. Method of manufacturing an insulated gate field effect device. 4,545,110, Cl. 29-571.000.
Macaire, Marcel: *See*—
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MacCanna, Cathal, to Garran Enterprises Limited. Method and apparatus for harvesting mushrooms and the like. 4,545,186, Cl. 56-327.00R.
Machida, Toshiaki, to Nippon Electric Co., Ltd. Digital processing circuit having a multiplication function. 4,546,446, Cl. 364-759.000.
Machida, Yoshimasa; Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Kitoh, Kyosuke; and Saito, Isao, to Eisai Co., Ltd. 7-Carboxymethoxyphenylacetamido-3-cephem derivatives and antibacterial preparations containing the same. 4,546,176, Cl. 544-21.000.
MacPherson, Edwin J.: *See*—
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Madonia, Ciro; Hatzikelis, Christopher; and Cosentino, Cesare C. Composite molding system. 4,546,022, Cl. 428-31.000.
Maeda, Takafumi; and Mine, Setsurou, to Tokyo Electric Power Co., Inc.; and Mitsubishi Denki Kabushiki Kaisha. Static reactive-power compensation apparatus. 4,546,303, Cl. 323-210.000.
Maeda, Yukio: *See*—
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Magnavox Government and Industrial Electronics Company: *See*—
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Mahrus, Duraid; and Bredemann, Peter, to Metal Leve S.A. Industria e Comercio. Plain bearings. 4,545,913, Cl. 252-12.600.
Maier, Gernot; Tischler, Heinrich; Wohr, Rolf; and Schwarzhoff, Wolfgang, to Robert Bosch GmbH. Modular electrical distribution connection set. 4,545,632, Cl. 339-18.00R.
Maijers, Andries C.; and Vos, Jan, to U.S. Philips Corporation. Electrical component comprising an electric circuit element having leads which are centered with respect to the walls of a housing. 4,546,209, Cl. 174-52.0PE.
Maisch, Wolfgang: *See*—
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,545,353, Cl. 123-454.000.
Makino, Teruyoshi: *See*—
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Malghan, Subhaschandra G., to Exxon Research and Engineering Co. Upgrading concentrates of paramagnetic sulfide minerals. 4,545,896, Cl. 209x5.000.
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Malley, Arthur, to Research Corporation. Timothy grass antigen specific anti-idiotypic antibodies. 4,545,986, Cl. 424-85.000.

Mallow, William A., to Gas Research Institute. Soil stabilizer and method for stabilizing soil. 4,545,820, Cl. 106-76.000.
Malminen, Henrikki: *See—*
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Maloney, Timothy J., to One Design, Inc. Solar heating module. 4,545,364, Cl. 126-430.000.
Mambelli, Giancarlo, to Motomec S.r.l. Multipurpose externally controlled device. 4,545,450, Cl. 180-53.100.
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Mannesmann Aktiengesellschaft: *See—*
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Marcadet, Luc; and Ozanne, Michel, to Dresser Industries, Inc. Valve coupling. 4,545,560, Cl. 251-58.000.
Marchetti, Augusto, to Comarme, S.p.A. Carton sealing machine with possibility of immediate opening of the sealing area during working. 4,545,176, Cl. 53-76.000.
Marchetti, Renato: *See—*
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Markle, David A., to Perkin-Elmer Corporation, The. Wafer alignment device. 4,545,683, Cl. 356-400.000.
Markov, Angel K. Use of fructose-1,6-diphosphate for treating myocardial infarction. 4,546,095, Cl. 514-23.000.
Marmet Corp.: *See—*
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Martel, Lisa; Knoedler, Roy E.; and Gerken, Donald L., to Cosco, Inc. Car seat carrier. 4,545,613, Cl. 297-250.000.
Martha, Eugene F., Jr., to Millipore Corporation. Container cap with frangible septum. 4,545,497, Cl. 215-253.000.
Martin, James L.; McCaskie, John E.; and Toben, Michael P., to LeaRonal, Inc. Palladium plating. 4,545,868, Cl. 204-47.000.
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Martin, Wayne A.; and Modic, Justin G., to United States Steel Corporation. Method and apparatus for performing multiple closed and semi-closed operations on an open die press. 4,545,232, Cl. 72-356.000.
Martin, William E. Apparatus and method of making cartons. 4,545,780, Cl. 493-11.000.
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Masaki, Katsumi; and Tago, Toshifumi, to Canon Kabushiki Kaisha. Output device capable of automatically determining an output format. 4,546,449, Cl. 364-900.000.
Maschinenfabrik Gehring, GmbH & Co. Kommanditgesellschaft: *See—*
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Matay, Istvan M., to TRW Inc. Acoustical position gage. 4,545,249, Cl. 73-597.000.
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Matrick, Howard, to Du Pont de Nemours, E. I., and Company. Toners treated with polymeric quaternary ammonium salts and slip agent. 4,546,072, Cl. 430-449.000.
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Shen, Ming; and McAfee, Richard C., 4,546,164, Cl. 528-15.000.

McCain, Iona I. Golf club and golf club support. 4,545,579, Cl. 273-162.00R.

McCallion, Joseph J.: *See—*
Giles, George B.; Ross, Donald B.; McCallion, Joseph J.; and Sherritt, William C., 4,545,759, Cl. 431-344.000.

McCammon, Patrick R., to Amana Refrigeration, Inc. Bearing support for microwave oven antenna. 4,546,225, Cl. 219-10.55F.

McCandless, Thomas J.: *See—*
Wilde, Sheldon L.; and McCandless, Thomas J., 4,545,496, Cl. 215-252.000.

McCann, R. Bruce: *See—*
Minerbo, Gerald N.; and McCann, R. Bruce, 4,546,314, Cl. 324-221.000.

McCartney Manufacturing Company: *See—*
Saurwein, Albert C., 4,545,157, Cl. 51-439.000.

McCaskie, John E.: *See—*
Martin, James L.; McCaskie, John E.; and Toben, Michael P., 4,545,868, Cl. 204-47.000.

McCloskey, Albert R., to Incom International Inc. Linear bearing assembly. 4,545,626, Cl. 308-6.00C.

McCluhan, Thomas K.: *See—*
Bilek, Paul J.; Flinn, Richard A.; McCluhan, Thomas K.; and Trojan, Paul K., 4,545,817, Cl. 75-123.00E.

McCormick, Ronald W.; and Rogers, Richard B., to Dow Chemical Company, The. Soil treating method and composition for conserving nitrogen in soil. 4,545,802, Cl. 71-27.000.

McCormick, Ronald W.: *See—*
Arndt, Kim E.; Rogers, Richard B.; and McCormick, Ronald W., 4,545,803, Cl. 71-27.000.

McCune, James D.: *See—*
Schantz, Robert E.; McCune, James D.; and Prunty, Pleasant A., 4,545,361, Cl. 126-226.000.

McCunn, Thomas H.; and Ziemianski, John P., to Allegheny Ludlum Steel Corporation. Method for producing a weldable austenitic stainless steel in heavy sections. 4,545,826, Cl. 148-12.00E.

McDonnell Douglas Corporation: *See—*
Brown, Henry C., 4,545,561, Cl. 251-129.080.
Lehoczky, Sandor L.; and Szofran, Frank R., 4,545,848, Cl. 156-616.00R.

McDowell, Kenneth J., Jr. Rotating film wrapping apparatus with traveling clamp. 4,545,182, Cl. 53-556.000.

McGeary, Peter G., to Whittaker Corporation. Weatherproof positive lock connector. 4,545,633, Cl. 339-42.000.

McGhee, Charles M. Valve. 4,545,399, Cl. 137-315.000.

McGivern, James F., Jr., to United Technologies Corporation. Method and apparatus for surface treating. 4,545,876, Cl. 204-130.000.

McIntyre, Dorthie J.: *See—*
Abu-Isa, Ismat A.; and McIntyre, Dorthie J., 4,545,614, Cl. 297-284.000.

McKelvey, Harold E., to Shatterproof Glass Corporation. Method and apparatus for detecting sputtering target depletion. 4,545,882, Cl. 204-192.00R.

McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, to CTBA Associates. Television and market research data collection system and method. 4,546,382, Cl. 358-84.000.

McKenzie, Donald: *See—*
Sheppard, Christine M.; Puxley, David C.; Banks, Reginald G. S.; and McKenzie, Donald, 4,546,091, Cl. 502-84.000.

McKnight, William H.: *See—*
Whitehouse, Harper J.; and McKnight, William H., 4,546,249, Cl. 250-227.000.

McLain, Clifford E. Matched expansion muzzle brake. 4,545,285, Cl. 89-14.300.

McLane, Jack E.; and Schenk, Raymond L., to Wirtz Manufacturing Company, Inc. Machine for continuously casting battery grids. 4,545,422, Cl. 164-429.000.

McMahon, Garfield W.: *See—*
Cielo, Paolo G.; and McMahon, Garfield W., 4,546,458, Cl. 367-149.000.

McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., to A. B. Chance Company. Electrical cutout having a linkbreak lever. 4,546,341, Cl. 337-177.000.

McNaught, John P.: *See—*
Izzo, Henry J.; and McNaught, John P., 4,546,003, Cl. 426-581.000.

McSherry, Charles K.: *See—*
Mosbach, Erwin H.; Une, Misuho; and McSherry, Charles K., 4,545,938, Cl. 260-397.100.

Mead Corporation, The: *See—*
Calvert, Rodney K., 4,545,476, Cl. 198-399.000.
Oliff, James R., 4,545,485, Cl. 206-434.000.

Mears, Lawrence N., to Lof Plastics Inc. Vehicle [illegible] strip structure. 4,546,021, Cl. 428-31.000.

Meatto, Franklin D.; and Pilpel, Edward D., to [illegible] in Corporation. Reinforcing ribs in a snow ski with a wood/fo[illegible]re. 4,545,597, Cl. 280-610.000.

Mechanical Technology Incorporated: *See—*
Corey, John A.; and Walsh, Michael M., 4,545,341, Cl. 123-192.00B.

MED-CALL: *See—*
Fane, William H., III, 4,546,211, Cl. 179-2.00A.

Medri, Mario W.: *See—*
Becker, Amy J.; Abbazia, Leonard P.; and Medri, Mario W., 4,545,989, Cl. 424-154.000.

Medtronic, Inc.: *See—*
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Meerman, Wilhelmus C. P. M., to U.S. Philips Corporation. Device for the continuous manufacture of elongated bodies starting from unmolten solid starting material. 4,546,484, Cl. 373-27.000.

Meffert, Alfred: *See—*
Peerman, Dwight E.; DiDomenico, Edward; Frisch, Kurt C.; and Meffert, Alfred, 4,546,120, Cl. 521-159.000.

Meisberger, Artur: *See—*
Weber, Wolfram; Neumann, Hans-Jurgen; Meisberger, Artur; and Mathieu, Bernd, 4,545,744, Cl. 417-475.000.

Mellul, Myriam: *See—*
Brun, Alain M.; Marcotte, Louis; and Mellul, Myriam, 4,546,312, Cl. 324-61.00P.

Mendiratta, Ashok K.; and Sikdar, Subhas K., to General Electric Company. Process for preparing anhydrous salts of dihydroxyaromatic compounds. 4,546,207, Cl. 568-723.000.

Mentrup, Anton: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Traunecker, Werner; and Reichl, Richard, 4,546,102, Cl. 514-259.000.

Merck & Co., Inc.: *See—*
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Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
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Merlin Gerin: *See—*
Jacquemet, Bernard; and Ravet, Jean-Paul, 4,546,223, Cl. 200-148.00R.
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Merten, Rudolf: *See—*
Zecher, Wilfried; Dunwald, Willi; Merten, Rudolf; and Reinking, Klaus, 4,546,162, Cl. 528-67.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
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Metal Leve S.A. Industria e Comercio: *See—*
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Metheus Corporation: *See—*
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Metreaud, Claude G.: *See—*
Hultmark, Eric B.; Metreaud, Claude G.; and Yacavonis, Robert A., 4,546,405, Cl. 361-386.000.

Metro Products (Accessories & Leisure) Limited: *See—*
Starmer, John E., 4,545,246, Cl. 116-315.000.

Metropolitan Furniture Corp.: *See—*
Kane, Brian J., 4,545,615, Cl. 297-287.000.

Mettenbrink, Herbert, to Bramlage GmbH. Dispenser for flowable substances. 4,545,510, Cl. 222-209.000.

Mettler Instrumente AG: *See—*
Kunz, Peter, 4,545,448, Cl. 177-212.000.

Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, to Bayer Aktiengesellschaft. Streptomyces species and process for producing antibiotic. 4,546,079, Cl. 435-71.000.

Metzner, Ernest K., to American Hoechst Corporation. Facile synthesis of β-hydroxy-β-methylglutaric acid. 4,546,203, Cl. 562-538.000.

Meunier, Paul J.: *See—*
Lunt, James; MacPherson, Edwin J.; and Meunier, Paul J., 4,546,119, Cl. 521-131.000.

Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-Phenylsulfonyl-N'-triazinyl-ureas. 4,545,811, Cl. 71-93.000.

Meyers, Robert A.; and Hart, Walter D., to TRW Inc. Extraction and upgrading of fossil fuels using fused caustic and acid solutions. 4,545,891, Cl. 208-11.00R.

Meyers, William E.; and Beck, Lee R., to Stolle Research & Development Corporation. Method and device for cell culture growth. 4,546,083, Cl. 435-240.000.

MG2 S.p.A.: *See—*
Gamberini, Ernesto, 4,545,412, Cl. 141-129.000.

Michaux, Thierry: *See—*
Jourde, Jean-Pierre; Cmapo-Garraza, Pedro; Miettaux, Marc; and Michaux, Thierry, 4,545,352, Cl. 123-447.000.

Microdynamics, Inc.: *See—*
Treadwell, Stephen S.; and Isett, Donald D., 4,545,310, Cl. 112-121.110.

Micropure, Incorporated: *See—*
Sachar, Kenneth S.; and Rich, Stanley R., 4,545,525, Cl. 239-3.000.

Middlekauff, Carle A., to Parker-Hannifin Corporation. Compact high torque hydraulic motors. 4,545,748, Cl. 418-61.00B.

Miettaux, Marc: *See—*
Jourde, Jean-Pierre; Cmapo-Garraza, Pedro; Miettaux, Marc; and Michaux, Thierry, 4,545,352, Cl. 123-447.000.

Miettunen, Aulis O., to Oy Partek Ab. Method for making concrete weather-resistant. 4,546,132, Cl. 524-8.000.

Mignien, Georges, to Les Cables de Lyon. Connection joining the ends of two under-water optical fiber cables and a method of manufacturing same. 4,545,645, Cl. 350-96.210.

Mihalik, John A.: *See*—
Wong, Carl Y.; Khan, Mir N.; and Mihalik, John A., 4,545,997, Cl. 426-94.000.
Mihaly, Frantisek: *See*—
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.
Mihojevich, Steven, to Continental Industries, Inc. Latch and lock assembly. 4,545,225, Cl. 70-71.000.
Mihovski, Mitko M.: *See*—
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Mikami, Yoshiharu: *See*—
Izumi, Asashiro; and Mikami, Yoshiharu, 4,545,630, Cl. 312-285.000.
Mikata, Hiromi: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,545,428, Cl. 165-110.000.
Miki, Toshinori: *See*—
Yamaguti, Terushige; Miki, Toshinori; Mannaka, Toshio; Koyama, Hiroshi; and Kawano, Yukihiro, 4,545,228, Cl. 72-16.000.
Miller, Bertram J.: *See*—
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Miller, Burton E.: *See*—
Fouts, Robert W., Jr.; Au, Andrew N. S.; Miller, Burton E.; and Gotcher, Alan J., 4,545,926, Cl. 252-511.000.
Miller, Calvin M.: *See*—
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Miller, David A.; Krueger, Leland R.; and Charlton, Richard J., to Charlton Associates. Force sensor for controlling polishing pad pressure. 4,545,153, Cl. 51-118.000.
Miller, David A. B., to AT&T Bell Laboratories. Nonlinear and bistable optical device. 4,546,244, Cl. 250-211.00J.
Miller, Gregory R.; and Clark, Steven G., to Bio-Care, Incorporated. Oxygen concentrator. 4,545,790, Cl. 55-161.000.
Miller, Nicholas E.: *See*—
Campbell, Bryant A.; and Miller, Nicholas E., 4,545,327, Cl. 118-719.000.
Miller, Richard N.; and Ray, K. Bruce. System for optimum irrigating and fertilizing. 4,545,396, Cl. 137-78.300.
Miller, Robert E.: *See*—
Brockett, Bruce W.; and Miller, Robert E., 4,546,365, Cl. 346-214.000.
Miller-Thomson, James J.; and Dupuis, Gilles, to Northern Telecom Limited. Single frequency detection circuit. 4,546,490, Cl. 381-56.000.
Milliken Research Corporation: *See*—
Varner, George C., 4,545,086, Cl. 8-151.000.
Millipore Corporation: *See*—
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Minami, Akira: *See*—
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, 4,545,932, Cl. 260-112.50R.
Minami, Satoyuki; Tanaka, Kazuhiro; and Nishioka, Takeshi, to Toray Industries, Inc. Polyethylene terephthalate film, process for the production thereof and magnetic recording medium therefrom. 4,546,030, Cl. 428-220.000.
Minday, Richard M.: *See*—
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Mine, Setsurou: *See*—
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Mineral Deposits Ltd.: *See*—
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Minerbo, Gerald N.; and McCann, R. Bruce, to Schlumberger Technology Corp. Method and apparatus for measuring the inside diameter of a metallic pipe in a well. 4,546,314, Cl. 324-221.000.
Minerbo, Gerald N.; and Hazen, Gary A., to Schlumberger Technology Corporation. Apparatus for measuring the inside diameter of a metallic pipe in a well. 4,546,315, Cl. 324-221.000.
Mineur, Thomas L.: *See*—
Dienes, Zoltan B.; and Mineur, Thomas L., 4,545,830, Cl. 156-48.000.
Minkus, Morton; and Drower, Herbert M., to Sealtran Corp. Lamination product and method employing temporary transfer film. 4,545,838, Cl. 156-220.000.
Minnesota Mining and Manufacturing Company: *See*—
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Olson, Paul B.; Minday, Richard M.; and Cooley, Julian B., 4,546,090, Cl. 502-69.000.
Renalls, Brenda L.; Pedrotty, Douglas G.; and Donlan, John F., 4,546,036, Cl. 428-323.000.
Minorikawa, Hitoshi: *See*—
Nakazawa, Terumi; Minorikawa, Hitoshi; and Kawakami, Kazuhiko, 4,546,412, Cl. 361-395.000.
Misawa Homes Co., Ltd.: *See*—
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Miskinis, Edward T.; and Jadwin, Thomas A., to Eastman Kodak Company. Two-component, dry electrographic developer compositions containing hard magnetic carrier particles and method for using the same. 4,546,060, Cl. 430-108.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Kohyama, Katsuhisa; Matsuno, Akira; and Tsuruhara, Kenji, 4,546,172, Cl. 528-491.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Maeda, Takafumi; and Mine, Setsurou, 4,546,303, Cl. 323-210.000.
Nakao, Kazushige; Ikeuchi, Masaki; Ozaki, Eiichi; and Yumikura, Tsuneo, 4,545,217, Cl. 62-476.000.
Nishida, Mitsuhiro; Yamamoto, Sakuei; Sonoda, Nobuo; Okahashi, Kazuo; and Takagi, Shoji, 4,546,130, Cl. 523-459.000.
Noda, Sadafumi, 4,545,212, Cl. 62-129.000.
Nomura, Masami, 4,545,464, Cl. 187-29.00R.
Suzuki, Mamoru; and Tanaka, Hiromoto, 4,545,767, Cl. 434-224.000.
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Yoshino, Souichi; Kusanagi, Tadashi; and Mori, Masakazu, 4,546,409, Cl. 361-387.000.
Mitsubishi Rayon Co., Ltd.: *See*—
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Mitsui Petrochemical Industries, Ltd.: *See*—
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Mitsui Toatsu Chemicals, Inc.: *See*—
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Mitterpach, Ivan: *See*—
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Miwa, Hirohide, to Fujitsu Limited. Measuring apparatus utilizing spectrum profile. 4,545,250, Cl. 73-602.000.
Miyai, Kenji: *See*—
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Miyai, Masuo, to Toyo Machinery Co., Ltd. Apparatus for correcting zigzag travel of running sheet. 4,545,516, Cl. 226-20.000.
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Miyaki, Takeo: *See*—
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Miyano, Masateru; Villamil, Clara I.; and Shone, Robert L., to G. D. Searle & Co. Substituted chromanon-2-yl alkanols and derivatives thereof. 4,546,194, Cl. 549-401.000.
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, to Kabushiki Kaisha Yakult Honsha. Photochemical process for preparing camptothecin derivatives. 4,545,880, Cl. 204-158.00R.
Miyasaka, Yoshiteru: *See*—
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Miyata, Jun; Yagii, Koji; and Shimizu, Tsutomu, to Mazda Motor Corporation. Apex seals for high power rotary piston engines. 4,545,825, Cl. 148-3.000.
Miyata, Takahide: *See*—
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Miyazaki, Wasei: *See*—
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Mizuno, Takao: *See*—
Tamura, Takahiro; Kuno, Hiroaki; Uchikawa, Naoshi; Murayama, Akira; and Mizuno, Takao, 4,545,747, Cl. 418-55.000.
Mizuno, Toshiya; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Vinylidene fluoride resin fiber and process for producing the same. 4,546,158, Cl. 526-255.000.
MM Systems Corporation: *See*—
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Mobay Chemical Corporation: *See*—
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Mobil Oil Corporation: *See*—
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Horodysky, Andrew G.; and Kaminski, Joan M., 4,545,915, Cl. 252-515.00R.
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Schmitt, Kirk D., 4,545,912, Cl. 252-8.55D.
Modic, Justin G.: *See*—
Martin, Wayne A.; and Modic, Justin G., 4,545,232, Cl. 72-356.000.
Moller, Hinrich; Wallat, Siegfried; and Bartnik, Friedhelm, to Henkel Kommanditgesellschaft auf Aktien. Arene-carboxylic acid derivatives as antiseborrheic additives for cosmetic agents. 4,545,984, Cl. 424-70.000.
Mollet, Adrianus J. T.: *See*—
Van Gils, Wilhelmus M. J.; Mollet, Adrianus J. T.; and Ridders, Johannes A. M., 4,545,774, Cl. 445-22.000.

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Woodbrey, James C.; Moncur, Marlowe V.; and Hedrick, Ross M., 4,546,147, Cl. 525-183.000.

Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., to Garrett Corporation, The. Variable geometry combustor apparatus. 4,545,196, Cl. 60-39.230.

Monolithic Memories, Inc.: *See—*
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Monsanto Company: *See—*
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Montle, Robert E.: *See—*
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Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., to Sperry Corporation. Control unit busy queuing. 4,546,430, Cl. 364-200.000.

Moore, David S.; and Schmidt, Stephen C., to United States of America, Energy. Frequency shift measurement in shock-compressed materials. 4,545,679, Cl. 356-301.000.

Morel, Don L.: *See—*
Exxon Research and Engineering Co.; Tiedje, J. Thomas; Morel, Don L.; and Abeles, Benjamin, 4,546,009, Cl. 427-39.000.

Morgan Construction Company: *See—*
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Mori, Hisakazu: *See—*
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Mori, Masakazu: *See—*
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Mori, Takaro; Saito, Susumu; and Fujii, Yasuhiko, to Victor Company of Japan Limited. Digital data transmission system with modified NRZI. 4,546,393, Cl. 360-40.000.

Morikawa, Kouji, to Fuji Jukogyo Kabushiki Kaisha. Intake system for an automotive engine. 4,545,347, Cl. 123-308.000.

Moring, Rodger L.; and Rieke, Brent E., to Caterpillar Tractor Co. Axle housing mounting bracket. 4,545,452, Cl. 180-88.000.

Morioka, Hiroaki; and Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Pressure regulator valve. 4,545,563, Cl. 251-298.000.

Morioka, Yoshihiro; and Sugimoto, Hiroyuki, to Sony Corporation. Focus circuit for multi-tube image pick-up apparatus. 4,546,291, Cl. 315-382.000.

Morishima, Norihisa: *See—*
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Morishita, Hirosada: *See—*
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,546,168, Cl. 528-107.000.

Morita, Shigeki; Masai, Tadahisa; Nakashita, Shigeto; Uemura, Toshio; Kouda, Fumio; and Nawata, Tsuyoshi, to Babcock-Hitachi Kabushiki Kaisha. Apparatus for coal combustion. 4,545,307, Cl. 110-264.000.

Morton, Steven G., to International Telephone & Telegraph Corporation. Associative array with transversal horizontal multiplexers. 4,546,428, Cl. 364-200.000.

Mosbach, Erwin H.; Une, Misuho; and McSherry, Charles K., to Beth Israel Medical Center. Chemical synthesis. 4,545,938, Cl. 260-397.100.

Moseley, Patrick T.: *See—*
Coetzer, Johan; Galloway, Roy C.; Bones, Roger J.; Teagle, David A.; and Moseley, Patrick T., 4,546,055, Cl. 429-103.000.

Mostosi, Angelo, to SACE S.p.A. Costruzioni Elettromeccaniche. Improved plug-in electric switch. 4,546,220, Cl. 200-50.0AA.

Mostosi, Angelo, to SACE S.p.A. Costruzioni Elettromeccaniche. Electric switch in which the control lever travel is arrested if the contacts become welded together. 4,546,224, Cl. 200-153.0OG.

Motomec S.r.l.: *See—*
Mambelli, Giancarlo, 4,545,450, Cl. 180-53.100.

Motooka, Masanori; Mantoku, Hitoshi; and Ohno, Takao, to Mitsui Petrochemical Industries, Ltd. Process for producing stretched articles of ultrahigh-molecular-weight polyethylene. 4,545,950, Cl. 264-210.600.

Motorola Inc.: *See—*
d'Aragona, F. Secco, 4,545,849, Cl. 156-617.0SP.
Holden, Irving H., 4,545,639, Cl. 339-256.00R.
Noufer, Glenn E., 4,546,453, Cl. 365-104.000.
Olsen, Dennis R.; and Spanjer, Keith G., 4,546,374, Cl. 357-71.000.
Unger, John D., 4,546,329, Cl. 331-16.000.

Mount Sinai School of Medicine, The: *See—*
Ornstein, Leonard, 4,545,831, Cl. 156-57.000.

Mouse Systems Corporation: *See—*
Kirsch, Steven T., 4,546,347, Cl. 340-710.000.

Mowbray, Kenneth D.: *See—*
Pfaff, Ernest H.; Mowbray, Kenneth D.; and Pacholok, David R., 4,546,319, Cl. 324-460.000.

Moyer, Robert D., to United States of America, Energy. Peak power ratio generator. 4,546,313, Cl. 324-103.00P.

MPR Corporation: *See—*
Chung, Yun H.; and Chung, Dennis E., 4,545,180, Cl. 53-456.000.

MTU Motoren-Und-Turbinen Union Munchen GmbH: *See—*
Schweikl, Ludwig; and Krauss, Olaf, 4,545,791, Cl. 55-182.000.

Mualem, Charles W. Wall spacer. 4,545,164, Cl. 52-404.000.

Mueller, Richard J.; and Chow, Edmund E., to Reed Industries, Inc. Electronic control circuits for electrically conductive liquids/solids. 4,545,505, Cl. 222-65.000.

Mukai, Nobuhiro: *See—*
Kishida, Kazuo; Sasaki, Isao; and Mukai, Nobuhiro, 4,546,145, Cl. 524-780.000.

Mukerjee, Ajit K.; Kearns, Patrick J.; and Rieman, Davis J., to BOC Group, Inc., The. Dual vessel heat exchange systems. 4,545,134, Cl. 34-27.000.

Muller, George H., to Ford Motor Company. Elevated roll center trailing arm suspension for motor vehicles. 4,545,600, Cl. 280-668.000.

Muller, George H.; and Chance, Buddy K., to Ford Motor Company. Stamped strut and spindle support. 4,545,601, Cl. 280-668.000.

Muller, Hanns P.; Hettel, Hans; Wagner, Kuno; and Vogtel, Peter, to Bayer Aktiengesellschaft. Process for the production of highly elastic foams containing urethane groups and foams obtainable by this process. 4,546,116, Cl. 521-106.000.

Multi-Tex Products Corp.: *See—*
Quon, Joe S., 4,546,042, Cl. 428-378.000.

Munz, Werner, to Schiedel GmbH & Co. Multiple-casing chimney. 4,545,293, Cl. 98-58.000.

Murakami, Hitomi: *See—*
Matsumoto, Shuichi; Hatori, Yoshinori; Murakami, Hitomi; and Yamamoto, Hideo, 4,546,386, Cl. 358-136.000.

Murakami, Yukihiro: *See—*
Arita, Yosihumi; Murakami, Yukihiro; and Yuasa, Miyabi, 4,545,762, Cl. 432-59.000.

Murakoshi, Makoto: *See—*
Konishi, Masahiro; and Murakoshi, Makoto, 4,546,390, Cl. 360-10.300.

Muramatsu, Michihisa: *See—*
Ishizumi, Kikuo; Muramatsu, Michihisa; Sato, Hiromi; Tanno, Norihiko; and Yoshida, Noboru, 4,545,936, Cl. 260-377.000.

Murase, Yoshihiko: *See—*
Tomita, Osamu; Murase, Yoshihiko; and Nishimura, Seiya, 4,545,580, Cl. 273-167.00R.

Murata, Hideki: *See—*
Asano, Masao; Sunaga, Tetsuro; Murata, Hideki; and Matsumoto, Kazumasa, 4,546,044, Cl. 428-413.000.

Murata Manufacturing Co., Ltd.: *See—*
Nishikawa, Toshio; Ishikawa, Youhei; and Yorita, Tadahiro, 4,546,334, Cl. 333-206.000.

Murayama, Akira: *See—*
Tamura, Takahiro; Kuno, Hiroaki; Uchikawa, Naoshi; Murayama, Akira; and Mizuno, Takao, 4,545,747, Cl. 418-55.000.

Murayama, Naohiro: *See—*
Mizuno, Toshiya; and Murayama, Naohiro, 4,546,158, Cl. 526-255.000.

Murphy, William J., to Saginaw Automation & Machine, Inc. Surgical leg clamp. 4,545,573, Cl. 269-328.000.

Murrenhoff, Hubertus: *See—*
Backe, Wolfgang; Weingarten, Franz; and Murrenhoff, Hubertus, 4,545,201, Cl. 60-420.000.

Murti, Dasarao K.: *See—*
Ong, Beng S.; and Murti, Dasarao K., 4,546,059, Cl. 430-59.000.

Muskens, Bernardus J.: *See—*
Loontjens, Jacobus A.; and Muskens, Bernardus J., 4,546,092, Cl. 502-105.000.

Musschoot, Albert; and Kraus, Richard B., to General Kinematics Corporation. Bin activator apparatus. 4,545,509, Cl. 222-198.000.

Mutai, Masahiko: *See—*
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,545,880, Cl. 204-158.00R.

Mutoh, Yoshihiko; Matsuda, Kazuo; Ohshima, Masashi; and Ohuchi, Hiroo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of dewaxing a vegetable oil. 4,545,940, Cl. 260-428.000.

Myers, Daryl L.: *See—*
Frazee, Ralph E., Jr.; Myers, Daryl L.; and Smithgall, David H., Sr., 4,545,542, Cl. 242-18.00A.

Myers, Donald W.: *See—*
Johnson, David E.; and Myers, Donald W., 4,545,714, Cl. 414-30.000.

Nabisco Brands, Inc.: *See—*
Gellman, Gary; Erfurt, George A.; and Roe, James E., 4,546,001, Cl. 426-549.000.

Nadievskaya, Juzefa I.: *See—*
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.

Nadler, Morton: *See—*
Abramatic, Jean-Francois; Nadler, Morton; and Letellier, Philippe, 4,546,383, Cl. 358-85.000.

Nagai, Hiroshi: *See—*
Sudoh, Chuzoh; Hagita, Hyoji; Asakawa, Motoo; Nagai, Hiroshi; and Aihara, Kenji, 4,545,227, Cl. 72-12.000.

Nagai, Satoshi: *See*—
Uchida, Kuniharu; Nagai, Satoshi; and Komura, Ichiroh, 4,545,251, Cl. 73-631.000.
Nagai, Yataro; and Fukuoka, Kazuya, to Tanken Seiko Corp. Mechanical face seal for sealing slurry liquid. 4,545,588, Cl. 277-93.0SD.
Nagano, Katsumasa: *See*—
Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, 4,545,939, Cl. 260-400.000.
Nagano, Mitsuo; Hirai, Koichi; Kitamura, Kouichi; Shinkai, Kenkichi; and Yasuda, Hiroshi, to Sankyo Company, Limited. Amino-acid derivatives, their preparation and their use as pharmaceuticals. 4,545,942, Cl. 260-465.00D.
Nagatani, Kuniaki: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Hayashi, Kouji, 4,546,191, Cl. 546-303.000.
Nagel, Judy A.: *See*—
Lambert, Robert L.; Nagel, Judy A.; and Bergamo, Robert L., 4,546,064, Cl. 430-270.000.
Nagumo, Shinichi; Toda, Yoshio; Nakajima, Yasuo; and Hase, Yoshifumi, to Nissan Motor Co., Ltd. System for controlling coolant temperature of internal combustion engine. 4,545,333, Cl. 123-41.020.
Nahum, Sylvain. Toothbrush. 4,545,087, Cl. 15-22.00R.
Naito, Hiroyasu, to Honda Giken Kogyo Kabushiki Kaisha. Theft preventing device. 4,546,345, Cl. 340-542.000.
Naito, Kazufumi, to Kabushiki Kaisha Ishida Koki Seisakusho. Span adjusting system of electronic weighing apparatus. 4,545,445, Cl. 177-25.000.
Naka, Hideo: *See*—
Kobashi, Toshiyuki; and Naka, Hideo, 4,546,146, Cl. 524-831.000.
Naka, Shigeharu: *See*—
Hirano, Shin-ichi; and Naka, Shigeharu, 4,545,968, Cl. 423-290.000.
Nakagawa, Takayoshi; and Hasegawa, Tadao, to Toyota Jidosha Kabushiki Kaisha. Lubricating oil cooling system for rear or mid engined vehicle. 4,545,334, Cl. 123-41.330.
Nakagawa, Tsuneo; Yamaguchi, Sadatsu; Amano, Toshihiko; and Asano, Kohzoh, to Daikin Kogyo Co., Ltd. Fluorine-containing copolymer. 4,546,157, Cl. 526-247.000.
Nakagawa, Yasuyuki, to Asahi Kakoshi Co., Ltd. Dust-proof reinforcing sheet material to be applied over handling opening formed on wall of box. 4,545,839, Cl. 156-244.110.
Nakahama, Ryoji; and Handa, Kenichi, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Tilt locking system for boat propellers. 4,545,769, Cl. 440-61.000.
Nakahara, Motohiro: *See*—
Miyajiri, Tetsuo; Habasaki, Toshimi; Yokota, Hiroshi; Tsurita, Tamio; and Nakahara, Motohiro, 4,545,801, Cl. 65-157.000.
Nakajima, Akihiro: *See*—
Ban, Itsuki; and Nakajima, Akihiro, 4,546,294, Cl. 318-311.000.
Nakajima, Yasuo: *See*—
Nagumo, Shinichi; Toda, Yoshio; Nakajima, Yasuo; and Hase, Yoshifumi, 4,545,333, Cl. 123-41.020.
Nakajima, Yoshikazu, to Kabushiki Kaisha Mikuni Seisakusho. Composite material compositions using waste synthetic fiber. 4,546,128, Cl. 523-222.000.
Nakamura, Akira. Apparatus for storing mercury-containing used products. 4,545,540, Cl. 241-99.000.
Nakamura, Haruyoshi: *See*—
Tanaka, Akira; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,545,193, Cl. 57-261.000.
Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Tsuboi, Yoshimasa, to Toyotomi Kogyo Co., Ltd. Pot-type oil burner. 4,545,758, Cl. 431-208.000.
Nakamura, Mitsugu; Yoshizu, Satoru; Sakata, Teiichi; and Yatabe, Hiroyuki, to Nippon Seiko Kabushiki Kaisha. Creep preventing device of an annular member. 4,545,627, Cl. 384-585.000.
Nakamura, Norihiko; and Kato, Takashi, to Toyota Jidosha Kabushiki Kaisha. Fuel controller of variable choke carburetor. 4,545,350, Cl. 123-439.000.
Nakamura, Shinichi: *See*—
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, 4,545,932, Cl. 260-112.50R.
Nakamura, Takeshi: *See*—
Hamano, Toshihisa; Nakamura, Takeshi; and Ito, Hisao, 4,546,243, Cl. 250-211.00R.
Nakamura, Yukihiro: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,545,809, Cl. 71-92.000.
Nakanishi, Kazuo: *See*—
Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,545,551, Cl. 242-35.50A.
Nakano, Masaaki: *See*—
Tomioka, Shunzoo; Nakano, Masaaki; Okano, Kinpei; Shimizu, Kousaku; and Yoda, Hiroaki, 4,545,741, Cl. 417-365.000.
Nakano, Yoshikatsu; and Matsuura, Masaaki, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for the control of valve operations in internal combustion engine. 4,545,342, Cl. 123-198.00F.
Nakao, Kazushige; Ikeuchi, Masaki; Ozaki, Eiichi; and Yumikura, Tsuneo, to Mitsubishi Denki Kabushiki Kaisha. Steam generating and condensing apparatus. 4,545,217, Cl. 62-476.000.
Nakashita, Shigeto: *See*—
Morita, Shigeki; Masai, Tadahisa; Nakashita, Shigeto; Uemura, Toshio; Kouda, Fumio; and Nawata, Tsuyoshi, 4,545,307, Cl. 110-264.000.
Nakasuji, Katsuyoshi: *See*—
Ryuzo, Mikami; and Nakasuji, Katsuyoshi, 4,546,018, Cl. 427-407.200.
Nakata, Haruo: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,545,428, Cl. 165-110.000.
Nakata, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for removing flashes from molded resin product. 4,545,155, Cl. 51-320.000.
Nakata, Toshikazu; and Toida, Takashi, to Citizen Watch Co., Ltd. Device for semiconductor integrated circuits. 4,546,376, Cl. 357-23.700.
Nakayama, Yasuo; Miyazaki, Wasei; and Shinohara, Masanao, to Otsuka Pharmaceutical Co., Ltd. Urokinase-plasmin complex adsorbable by fibrin and process for preparing same. 4,545,988, Cl. 424-94.000.
Nakazawa, Terumi; Minorikawa, Hitoshi; and Kawakami, Kazuhiko, to Hitachi, Ltd. Electronic device for automobile. 4,546,412, Cl. 361-395.000.
Nalco Chemical Company: *See*—
Connelly, Lawrence J.; and Selvarajan, Radhakrishnan, 4,545,902, Cl. 210-734.000.
Fong, Dodd W.; and Kowalski, David J., 4,546,156, Cl. 526-240.000.
Lorenc, Walter F.; Kelly, John A.; and Mandel, Frederick S., 4,545,920, Cl. 252-180.000.
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,545,411, Cl. 141-91.000.
Nambu, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Data transmission system with distributed microprocessors. 4,546,351, Cl. 340-825.500.
Naruto, Shunsuke: *See*—
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, 4,545,932, Cl. 260-112.50R.
National Plastics Limited: *See*—
Bennett, Julian; and Salsby, Bernard, 4,545,499, Cl. 215-352.000.
National Research Development Corporation: *See*—
Booth, Eric, 4,545,616, Cl. 297-320.000.
Dawson, Glenn W.; Griffiths, David C.; and Pickett, John A., 4,546,110, Cl. 514-529.000.
Klinner, Wilfred E., 4,545,188, Cl. 56-364.000.
National Semiconductor Corporation: *See*—
Llewellyn, William D., 4,546,307, Cl. 323-315.000.
National Starch and Chemical Corporation: *See*—
Shih, Yen-Jer, 4,546,140, Cl. 524-394.000.
Nausedas, Joseph A.; and Beckman, John H., to Union Carbide Corporation. Method for stuffing a cored casing article. 4,545,091, Cl. 17-49.000.
Nawata, Tsuyoshi: *See*—
Morita, Shigeki; Masai, Tadahisa; Nakashita, Shigeto; Uemura, Toshio; Kouda, Fumio; and Nawata, Tsuyoshi, 4,545,307, Cl. 110-264.000.
Naylor, Michael; and Latham, Robert, to Racal-SES Limited. Communications systems. 4,546,470, Cl. 370-97.000.
NCR Corporation: *See*—
Ito, Masakazu; and Izawa, Hikaru, 4,545,141, Cl. 40-531.000.
Neary, Michael P. Solar energy system. 4,545,207, Cl. 60-645.000.
NEC Corporation: *See*—
Ryu, Toshihiko, 4,546,323, Cl. 329-124.000.
Umemura, Mamoru; and Yokota, Minoru, 4,546,432, Cl. 364-200.000.
NEC Home Electronics, Ltd.: *See*—
Agata, Kazuhiro, 4,545,695, Cl. 400-320.000.
Nedzvetsky, Viktor S.: *See*—
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.
Negi, Shigeto: *See*—
Machida, Yoshimasa; Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Kitoh, Kyosuke; and Saito, Isao, 4,546,176, Cl. 544-21.000.
Neidich, Douglas A., to Du Pont de Nemours, E. I., and Company. Rib cage terminal. 4,545,638, Cl. 339-205.000.
Neidleman, Saul L.; and Geigert, John, to Cetus Corporation. Manufacture of halogenated ketones and aldehydes. 4,546,080, Cl. 435-148.000.
Neier, Wilhelm; Webers, Werner; and Dettmer, Michael, to Deutsche Texaco Aktiengesellschaft. Process for producing methyl tert. alkyl ether. 4,546,206, Cl. 568-697.000.
Nelson, Larry N. Rake with grasping apparatus. 4,545,189, Cl. 56-400.120.
Nelson, Norvell J., to Psi Star. Regenerative copper etching process and solution. 4,545,850, Cl. 156-642.000.
Nestec S.A.: *See*—
Olsson, Sven, 4,545,092, Cl. 17-71.000.
Nestor, Jack; and Devine, John W., Jr. Semi-rigid penile prosthesis with separable members and posture control. 4,545,081, Cl. 623-11.000.
Neumann, Hans-Jurgen: *See*—
Weber, Wolfram; Neumann, Hans-Jurgen; Meisberger, Artur; and Mathieu, Bernd, 4,545,744, Cl. 417-475.000.
Neumann, Klaus; and Kleber, Heinrich, to E. Reichert Optische Werke AG. Cryogenic fixation apparatus. 4,545,218, Cl. 62-514.00R.

Newman, Robert; and Johnson, Fred, to Monolithic Memories, Inc. Process for controlling thickness of die attach adhesive. 4,545,840, Cl. 156-276.000.

Nichias Corporation: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.

Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., to Velsicol Chemical Corporation. 3-Chlorobenzyl-3,6-dichloro-2-methoxybenzoate as a citrus ripener. 4,545,813, Cl. 71-107.000.

Nickell, Louis G.: *See*—
Luteri, George F.; Stach, Leonard J.; and Nickell, Louis G., 4,546,196, Cl. 560-65.000.

Nickerson, Rand B.: *See*—
McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, 4,546,382, Cl. 358-84.000.

Nicodemus, Carl D., to Helios Research Corp. Start-up for hydrokinetic amplifier. 4,545,739, Cl. 417-152.000.

Nicoll, Andrew R., to BBC Aktiengesellschaft Brown, Boveri & Cie. High-temperature protective layer. 4,546,052, Cl. 428-679.000.

Nielsen, Arnold D., to Ford Motor Company. Solenoid switching driver with solenoid current proportional to an analog voltage. 4,546,403, Cl. 361-154.000.

Nielsen, John C.; and Flair, Henry J., to Illinois Tool Works Inc. Method and apparatus for checking toothed articles. 4,545,126, Cl. 33-179.50R.

Nielsen, Steen H.: *See*—
Jensen, Hans-Erik K.; Abildgaard, Niels; and Nielsen, Steen H., 4,545,259, Cl. 73-861.280.

Niemiro, Josef W.; and Skipor, Eugene, to Rockwell International Corporation. Anti-dog-ear device for a folding apparatus. 4,545,782, Cl. 493-425.000.

Nieveen van Dijkum, Adalbertus H. J.; Thuis, Robbert C.; and Zandveld, Paul, to U.S. Philips Corporation. Semiconductor device having an improved dual-gate field effect transistor. 4,546,371, Cl. 357-51.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,545,944, Cl. 260-545.00R.

Niinomi, Masahiro; Okubo, Yukihiro; Igarashi, Yoshinori; and Yoshinari, Masashi, to Japan Synthetic Rubber Co., Ltd. Sealant composition. 4,546,166, Cl. 528-60.000.

Nineuil, Guy, to Rhone-Poulenc Chimie de Base. Process and apparatus for discharging and degassing a slurry from an attack tank. 4,545,788, Cl. 55-52.000.

Ninomiya, Yuki; and Yagi, Haruhiko, to Pentel Kabushiki Kaisha. Ink supply device for an inking type wire dot printer. 4,545,694, Cl. 400-124.000.

Nippon Achakutanshi Seizo Kabushiki Kaisha: *See*—
Saijo, Yoshihiro, 4,545,634, Cl. 339-97.00P.

Nippon Electric Co., Ltd.: *See*—
Machida, Toshiaki, 4,546,446, Cl. 364-759.000.
Yamamoto, Sumio, 4,546,467, Cl. 370-13.000.
Yamanari, Kenzo, 4,546,368, Cl. 357-24.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Tomita, Osamu; Murase, Yoshihiko; and Nishimura, Seiya, 4,545,580, Cl. 273-167.00R.

Nippon Kogaku K.K.: *See*—
Wakabayashi, Hiroshi, 4,545,666, Cl. 354-412.000.

Nippon Light Metal Co., Ltd.: *See*—
Inokawa, Michio; Watanabe, Minoru; Miyasaka, Yoshiteru; and Watanabe, Toshio, 4,545,292, Cl. 98-42.210.

Nippon Piston Ring Co., Ltd.: *See*—
Sakamaki, Hiroshi; and Horikoshi, Yukio, 4,545,749, Cl. 418-173.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Nakamura, Mitsugu; Yoshizu, Satoru; Sakata, Teiichi; and Yatabe, Hiroyuki, 4,545,627, Cl. 384-585.000.

Nippon Soken, Inc.: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, 4,546,338, Cl. 335-229.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Miyajiri, Tetsuo; Habasaki, Toshimi; Yokota, Hiroshi; Tsurita, Tamio; and Nakahara, Motohiro, 4,545,801, Cl. 65-157.000.

Nippon Zoki Pharmaceutical Co. Ltd.: *See*—
Okamoto, Kaoru; Hamada, Masaki; and Kurosaki, Teikichi, 4,545,993, Cl. 514-456.000.

Nippondenso Co., Ltd.: *See*—
Fujiwara, Kenichi; Sugi, Hikaru; and Hasada, Eiichi, 4,545,213, Cl. 6 R-158.000.
Ido, Akinori; and Uchida, Goro , 4,545,526, Cl. 237-12.30A.
Takao, Mitsunori; and Kimura, Takahiko, 4,545,355, Cl. 123-489.000.
Tanaka, Ryoichi; and Sakurai, Yasuhiko, 4,546,265, Cl. 307-10.0CS.

Nishida, Mitsuhiro; Yamamoto, Sakuei; Sonoda, Nobuo; Okahashi, Kazuo; and Takagi, Shoji, to Mitsubishi Denki Kabushiki Kaisha. Molding material for the stator of a submersible motor. 4,546,130, Cl. 523-459.000.

Nishikawa, Toshio; Ishikawa, Youhei; and Yorita, Tadahiro, to Murata Manufacturing Co., Ltd. Electrical filter device. 4,546,334, Cl. 333-206.000.

Nishikiori, Kenji; and Ozawa, Naomitsu, to Ebara Corporation. Automatic operating system for pump driven by internal combustion engine. 4,545,740, Cl. 417-317.000.

Nishimoto, Kazuo: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.

Nishimura, Seiya: *See*—
Tomita, Osamu; Murase, Yoshihiko; and Nishimura, Seiya, 4,545,580, Cl. 273-167.00R.

Nishimura, Shuichi: *See*—
Ito, Masafumi; Nishimura, Shuichi; and Hara, Yoichi, 4,545,331, Cl. 123-26.000.

Nishio, Tadashi: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,545,702, Cl. 405-269.000.

Nishioka, Takeshi: *See*—
Minami, Satoyuki; Tanaka, Kazuhiro; and Nishioka, Takeshi, 4,546,030, Cl. 428-220.000.

Nishiyama, Noboru: *See*—
Sasaki, Hiroaki; Nishiyama, Noboru; and Kamada, Akio, 4,546,230, Cl. 219-121.0LD.

Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Hayashi, Kouji, to Ishihara Sangyo Kaisha Ltd. Trifluoromethyl-2-pyridinone or pyridinthione compounds and process for the preparation of the same. 4,546,191, Cl. 546-303.000.

Niskin, Shale J. Nonrotating current meter housing. 4,545,243, Cl. 73-170.00A.

Nissan Motor Co., Ltd.: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,545,265, Cl. 74-868.000.
Gotoh, Miyuki; and Wada, Yoshimi, 4,546,263, Cl. 250-561.000.
Hayashi, Yoshimasa, 4,545,335, Cl. 123-41.270.
Ikeura, Kenji, 4,545,348, Cl. 123-339.000.
Ito, Masafumi; Nishimura, Shuichi; and Hara, Yoichi, 4,545,331, Cl. 123-26.000.
Nagumo, Shinichi; Toda, Yoshio; Nakajima, Yasuo; and Hase, Yoshifumi, 4,545,333, Cl. 123-41.020.
Shibahata, Yasuji, 4,545,602, Cl. 280-701.000.
Yoshida, Kenichi, 4,545,198, Cl. 60-39.250.

Nisshin Steel Co., Ltd.: *See*—
Uchida, Yukio; Takagi, Kazuhiro; Katayama, Kiichiro; and Kawase, Hisao, 4,546,051, Cl. 428-653.000.
Yamaguti, Terushige; Miki, Toshinori; Mannaka, Toshio; Koyama, Hiroshi; and Kawano, Yukihiro, 4,545,228, Cl. 72-16.000.

Nisus Video Incorporated: *See*—
Swinehart, Steven L.; and Kuhn, Werner H., 4,545,659, Cl. 352-216.000.

Nitschko, Theodor: *See*—
Spitaler, Engelbert; Oberleitner, Gerhard; Svoboda, Josef; Nitschko, Theodor; and Riss, Wilfried, 4,545,598, Cl. 280-612.000.

Niwa, Katsuhisa; and Ikeda, Takahiro, to West Electric Company, Ltd. Camera with automatic strobe. 4,545,667, Cl. 354-419.000.

Noda, Sadafumi, to Mitsubishi Denki Kabushiki Kaisha. Super-heat detector for refrigerating apparatus. 4,545,212, Cl. 62-129.000.

Nokata, Kenichiro: *See*—
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,545,880, Cl. 204-158.00R.

Nolan, Dennis C., to Allen-Bradley Company. Compensated ramp generating circuit for controlling SCR firing. 4,546,424, Cl. 363-87.000.

Nomoto, Seiichiro: *See*—
Machida, Yoshimasa; Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Kitoh, Kyosuke; and Saito, Isao, 4,546,176, Cl. 544-21.000.

Nomura, Masami, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for controlling an A-C power elevator. 4,545,464, Cl. 187-29.00R.

Norchem, Inc.: *See*—
Bosen, Sidney F.; and Perlson, Bruce D., 4,545,925, Cl. 252-389.00A.

Nordson Corporation: *See*—
Donges, William E., 4,546,414, Cl. 361-413.000.

Noreikat, Karl-Ernst: *See*—
Hafner, Gunther; Noreikat, Karl-Ernst; Schmidt, Hans-Dieter; Letsche, Ulrich; and Bauer, Bernhard, 4,546,426, Cl. 364-153.000.

North American Philips Consumer Electronics Corp.: *See*—
Collins, Floyd K.; Hovey, Frederick A.; and Maninger, Loren L., 4,546,287, Cl. 313-414.000.

North American Philips Corporation: *See*—
Kent, Thomas A.; and Shaffer, Jesse S., 4,546,415, Cl. 361-433.000.
Lambert, Robert L.; Nagel, Judy A.; and Bergamo, Robert L., 4,546,064, Cl. 430-270.000.
Ridgley, James R.; and Reeder, Bruce L., 4,545,474, Cl. 194-1.00E.

Northeast Pyreduction Corp.: *See*—
Wolfram, Norman E., 4,545,306, Cl. 110-247.000.

Northern Telecom Limited: *See*—
Laing, Graham S., 4,546,214, Cl. 179-81.00C.
Miller-Thomson, James J.; and Dupuis, Gilles, 4,546,490, Cl. 381-56.000.
Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, 4,545,858, Cl. 162-267.000.

Noufer, Glenn E., to Motorola, Inc. Four-state ROM cell with increased differential between states. 4,546,453, Cl. 365-104.000.

Novatny, Donald F., to Boise Cascade Corporation. U-Shaped support pad for appliances and the like. 4,545,482, Cl. 206-320.000.

Nozaki, Shigeki; and Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device. 4,546,457, Cl. 365-230.000.

Nozawa, Yasushi: *See—*
Kitaguchi, Hiroshi; Itoh, Isamu; Fujiwara, Itsuo; Nozawa, Yasushi; and Kokubo, Tadayoshi, 4,546,075, Cl. 430-617.000.
Nujack Oil Pump Corporation: *See—*
Stanton, George E., 4,545,737, Cl. 417-53.000.
Nunn, William M., III: *See—*
List, John F.; and Nunn, William M., III, 4,545,418, Cl. 160-213.000.
Nussenbaum, Joseph: *See—*
Gresser, Herbert D.; and Nussenbaum, Joseph, 4,546,231, Cl. 219-121.0LN.
Nyfeler, Robert, to Ciba-Geigy Corporation. N-Aminomethyl-3-phenyl-4-cyanopyrrole derivatives, compositions and use thereof as microbicides. 4,546,099, Cl. 514-212.000.
Oakland Corporation, The: *See—*
Wallace, Richard B., 4,545,712, Cl. 411-258.000.
Obara, Haruki: *See—*
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,546,227, Cl. 219-69.00W.
Oberdorfer, Guido. Radial piston pump with a star-shaped connecting piece. 4,545,732, Cl. 417-273.000.
Oberleitner, Gerhard: *See—*
Spitaler, Engelbert; Oberleitner, Gerhard; Svoboda, Josef; Nitschko, Theodor; and Riss, Wilfried, 4,545,598, Cl. 280-612.000.
Oberstrass, Detlev, to Barmag Barmer Maschinenfabrik AG. Yarn false twisting apparatus. 4,545,192, Cl. 57-105.000.
Occidental Chemical Corporation: *See—*
Stodolka, Mark J., 4,545,822, Cl. 134-10.000.
Ochii, Kiyofumi: *See—*
Iwahashi, Hiroshi; and Ochii, Kiyofumi, 4,546,455, Cl. 365-200.000.
Ochs, Leonard R., to Duval Corporation. Process for recovery of metal chloride and cuprous chloride complex salts. 4,545,972, Cl. 423-463.000.
Odaka, Kentaro: *See—*
Sako, Yoichiro; and Odaka, Kentaro, 4,546,474, Cl. 371-39.000.
Odawara, Masachika: *See—*
Ikeda, Takashi; and Odawara, Masachika, 4,545,725, Cl. 415-180.000.
Odenwalder, Heinrich: *See—*
Bergthaller, Peter; Odenwalder, Heinrich; and Matejec, Reinhard, 4,546,073, Cl. 430-543.000.
O'Donnell, Robert N.: *See—*
Galbreath, Donald E.; Roudebush, Brooks; and O'Donnell, Robert N., 4,545,523, Cl. 232-43.100.
Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., 4,546,310, Cl. 324-52.000.
Officine Meccaniche Sernagiotto: *See—*
Visconti, Alfonso; Sernagiotto, Emilio; and Sernagiotto, Raffaello M., 4,545,903, Cl. 210-96.100.
Officine Savio SpA· *See —*
Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, 4,545,191, Cl. 57-22.000.
Ogasawara, Takaaki; Maruyama, Tokuji; Sato, Masaharu; Hida, Yukio; and Saito, Takashi, to Kabushiki Kaisha Kobe Seiko Sho. Output control of short circuit welding power source. 4,546,234, Cl. 219-137.0PS.
Oguchi, Yukio; and Yasukawa, Kazuyoshi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Operation control apparatus for industrial robot. 4,546,443, Cl. 364-513.000.
Ohara, Shunji: *See—*
Koishi, Kenji; Yoshida, Tomio; Satoh, Isao; and Ohara, Shunji, 4,546,462, Cl. 369-53.000.
Ohashi, Hiromichi: *See—*
Tsukakoshi, Tsuneo; and Ohashi, Hiromichi, 4,546,369, Cl. 357-39.000.
Ohashi, Takashi: *See—*
Hashimoto, Takatsugu; and Ohashi, Takashi, 4,546,127, Cl. 523-219.000.
Ohashi, Yuichi: *See—*
Kamei, Sadao; Ohashi, Yuichi; Ukai, Toshinao; Yamamuro, Kiyohiko; and Takei, Haruo, 4,546,074, Cl. 430-573.000.
Ohba, Hisao; Shirai, Akira; Kitazumi, Etsuo; and Kato, Norihiko, to Fuji Photo Film Co., Ltd. Process for producing support for planographic printing. 4,545,866, Cl. 204-33.000.
Ohi, Nobukazu: *See—*
Ohno, Koji; Ohi, Nobukazu; and Hayashi, Syohei, 4,546,006, Cl. 427-2.000.
Ohio Medical Instrument Company, Inc.: *See—*
Day, James L., 4,545,572, Cl. 269-328.000.
Ohmori, Takashi: *See—*
Kurata, Masami; and Ohmori, Takashi, 4,546,381, Cl. 358-78.000.
Ohno, Koji; Ohi, Nobukazu; and Hayashi, Syohei, to G-C Dental Industrial Corp. Method for strengthening porcelain tooth. 4,546,006, Cl. 427-2.000.
Ohno, Shigeru: *See—*
Kishimoto, Shinzo; Ohno, Shigeru; and Abe, Akira, 4,546,070, Cl. 430-393.000.
Ohno, Takao: *See—*
Motooka, Masanori; Mantoku, Hitoshi; and Ohno, Takao, 4,545,950, Cl. 264-210.600.
Ohshima, Masashi: *See—*
Mutoh, Yoshihiko; Matsuda, Kazuo; Ohshima, Masashi; and Ohuchi, Hiroo, 4,545,940, Cl. 260-428.000.
Ohshima, Toshihisa; and Soda, Kenji, to Unitika Ltd. Leucine dehydrogenase and a process for production thereof. 4,546,077, Cl. 435-26.000.
Ohta, Mitsuru: *See—*
Kidoh, Kunizoh; and Ohta, Mitsuru, 4,546,149, Cl. 525-199.000.
Ohuchi, Hiroo: *See—*
Mutoh, Yoshihiko; Matsuda, Kazuo; Ohshima, Masashi; and Ohuchi, Hiroo, 4,545,940, Cl. 260-428.000.
Ohwaki, Shinji: *See—*
Yoshimoto, Masato; and Ohwaki, Shinji, 4,546,043, Cl. 428-397.000.
Oike, Ikuo; and Miyata, Takahide, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust device of a two-cycle engine for a motorcycle. 4,545,200, Cl. 60-314.000.
Oiles Kogyo Kabushiki Kaisha: *See—*
Izeki, Jiro; and Shimoda, Ikuo, 4,545,466, Cl. 188-268.000.
Okabe, Shotaro: *See—*
Fujiyama, Yasutomo; and Okabe, Shotaro, 4,545,328, Cl. 118-723.000.
Okada, Toshiro, to Fujitsu Limited. Phase-locked loop circuit. 4,546,330, Cl. 331-17.000.
Okado, Chihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Control system for a voltage-type inverter. 4,546,422, Cl. 363-41.000.
Okahashi, Kazuo: *See—*
Nishida, Mitsuhiro; Yamamoto, Sakuei; Sonoda, Nobuo; Okahashi, Kazuo; and Takagi, Shoji, 4,546,130, Cl. 523-459.000.
Okamoto, Kaoru; Hamada, Masaki; and Kurosaki, Teikichi, to Nippon Zoki Pharmaceutical Co. Ltd. 1,2-Benzopyran-b-yl acetic acid. 4,545,993, Cl. 514-456.000.
Okamoto, Takachiyo, to Brother Kogyo Kabushiki Kaisha. Method of making a stator bar usable in a linear stepper motor. 4,545,117, Cl. 29-596.000.
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Anaerobic curing adhesive compositions. 4,546,125, Cl. 523-176.000.
Okano, Kinpei: *See—*
Tomioka, Shunzoo; Nakano, Masaaki; Okano, Kinpei; Shimizu, Kousaku; and Yoda, Hiroaki, 4,545,741, Cl. 417-365.000.
Oki Electric Industry Co., Ltd.: *See—*
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,546,333, Cl. 333-202.000.
Itoh, Katsuyuki; Itoh, Shinichi; and Otsuki, Michiaki, 4,545,670, Cl. 355-3.0DD.
Okubo, Yukihiro: *See—*
Niinomi, Masahiro; Okubo, Yukihiro; Igarashi, Yoshinori; and Yoshinari, Masashi, 4,546,166, Cl. 528-60.000.
Okura Kogyo Kabushiki Kaisha: *See—*
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,546,125, Cl. 523-176.000.
Oliff, James R., to Mead Corporation, The. Bottle carrier chime engaging flap structure. 4,545,485, Cl. 206-434.000.
Olin Corporation: *See—*
Farmer, Julian K.; and Hawk, Charles W., Jr., 4,545,961, Cl. 422-193.000.
Meatto, Franklin D.; and Pilpel, Edward D., 4,545,597, Cl. 280-610.000.
Yeager, Howard L.; and Malinsky, J. David, 4,545,863, Cl. 204-1.00T.
Olovsson, Gunnar. Vertically adjustable picking box. 4,545,463, Cl. 187-9.00R.
Olsen, Dennis R.; and Spanjer, Keith G., to Motorola Inc. Semiconductor device including plateless package. 4,546,374, Cl. 357-71.000.
Olson, Paul B.; Minday, Richard M.; and Cooley, Julian B., to Minnesota Mining and Manufacturing Company. Hollow zeolite-containing particles useful as refining catalysts. 4,546,090, Cl. 502-69.000.
Olson, William J. Continuous forms leader. 4,545,517, Cl. 226-92.000.
Olsson, Sven, to Nestec S.A. Squid trimming apparatus. 4,545,092, Cl. 17-71.000.
Olympus Optical Company Limited: *See—*
Furuta, Kenji, 4,546,399, Cl. 360-137.000.
Kato, Kiichi; and Sakamoto, Masaharu, 4,545,651, Cl. 350-394.000.
Kimura, Kenji, 4,546,391, Cl. 360-19.100.
Omega SA: *See—*
Fontana, Fernando, 4,545,094, Cl. 24-71.00J.
Fontana, Fernando, 4,545,095, Cl. 24-71.00J.
Xuan, Mai T., 4,546,278, Cl. 310-49.00R.
OMI International Corporation: *See—*
Goldman, Irina, 4,545,869, Cl. 204-47.000.
Omron Tateisi Electronics Co.: *See—*
Imamichi, Tutomu, 4,546,240, Cl. 235-379.000.
One Design, Inc.: *See—*
Maloney, Timothy J., 4,545,364, Cl. 126-430.000.
O'Neill, Mark J., to Entech, Inc. Bi-focussed solar energy concentrator. 4,545,366, Cl. 126-440.000.
Ong, Beng S.; and Murti, Dasarao K., to Xerox Corporation. Layered photoresponsive imaging members with sulfur incorporated dicyanomethylenefluorene carboxylate compositions. 4,546,059, Cl. 430-59.000.
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, to Daikin Kogyo Co., Ltd. Heat exchanger for air conditioning system. 4,545,428, Cl. 165-110.000.
Ono, Minoru; Makino, Teruyoshi; and Kikuchi, Hisashi, to Fuji Photo Film Co., Ltd. Film unit for instant camera. 4,546,061, Cl. 430-207.000.
Ono, Takatoshi: *See—*
Sekiya, Shinji; and Ono, Takatoshi, 4,545,154, Cl. 51-209.00R.

Opheij, Willem G.; and van Rosmalen, Gerard E., to U.S. Philips Corporation. Apparatus for recording and reading information tracks on an optical record carrier with a beam of radiation. 4,546,463, Cl. 369-110.000.

Oppenlander, Knut: *See*—
Baur, Richard; Oppenlander, Knut; Strickler, Rainer; and Barthold, Klaus, 4,546,151, Cl. 525-430.000.

Ordonez, Jose: *See*—
Lakritz, Mark N.; Ordonez, Jose; and Tubiola, Peter J., 4,545,610, Cl. 29-589.000.

Ornstein, Leonard, to Mount Sinai School of Medicine, The. Method for transferring a thin tissue section. 4,545,831, Cl. 156-57.000.

Orth, Winfried; and Fickert, Werner, to Rutgerswerke Aktiengesellschaft. Method for producing 3,5,6-trichloro-1H-pyridine-2-on. 4,546,190, Cl. 546-303.000.

Osaka, Kuniaki: *See*—
Watanabe, Hiroyuki; Osaka, Kuniaki; and Tanaka, Yasushi, 4,545,589, Cl. 280-5.00A.

Oshima, Susumu: *See*—
Onishi, Toshiya; Oshima, Susumu; Mikata, Hiromi; Nakata, Haruo; and Horiuchi, Masami, 4,545,428, Cl. 165-110.000.

Osman, Fazil I., to Burroughs Corporation. Dynamic re-programmable PLA. 4,546,273, Cl. 307-468.000.

Osman, Robert M., to Exxon Research & Engineering Co. Hydrocarbon steam reforming using series steam superheaters. 4,545,976, Cl. 423-650.000.

Oswald, Alexis A.: *See*—
Rossi, Albert; Rehrer, David H.; Oswald, Alexis A.; Lewtas, Kenneth; and Tack, Robert D., 4,546,137, Cl. 524-217.000.

Othman, Allan, to Oy Partek Ab. Inlet for a cooler in a rotary furnace. 4,545,763, Cl. 432-78.000.

Otis Engineering Corporation: *See*—
Canalizo, Carlos R.; and Hays, James M., 4,545,731, Cl. 417-86.000.

O'Toole, Richard M.: *See*—
Carey, Bruce P.; and O'Toole, Richard M., 4,545,165, Cl. 52-488.000.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Nakayama, Yasuo; Miyazaki, Wasei; and Shinohara, Masanao, 4,545,988, Cl. 424-94.000.

Otsuki, Michiaki: *See*—
Itoh, Katsuyuki; Itoh, Shinichi; and Otsuki, Michiaki, 4,545,670, Cl. 355-3.0DD.

Ott, William E., to United States of America, Air Force. Total temperature probe buffer amplifier. 4,546,320, Cl. 328-3.000.

Ouss, Jean: *See*—
Favrel, Jean-Paul; Ouss, Jean; and Pocheau, Jean-Marc, 4,546,469, Cl. 370-77.000.

Outboard Marine Corporation: *See*—
Ferguson, Arthur R., 4,545,770, Cl. 440-61.000.

Ovshinsky, Stanford R.; Sapru, Krishna; and Yee, Edmund L., to Energy Conversion Devices, Inc. Electrolytic cell cathode. 4,545,883, Cl. 204-192.0SP.

Owens-Corning Fiberglas Corporation: *See*—
Crosby, E. Eugene, 4,545,796, Cl. 65-15.000.
Ritter, George W., II, 4,545,924, Cl. 252-315.700.
Uffner, William E.; and White, Robert N., 4,545,699, Cl. 404-31.000.

Oxel, Berton R., to Hoover Company, The. Floor care appliance with mounted accessory appliance. 4,545,089, Cl. 15-323.000.

Oxsen, Michael E.: *See*—
Ko, Ming; Oxsen, Michael E.; and Prime, Robert B., 4,546,035, Cl. 428-315.900.

Oy Partek Ab: *See*—
Miettunen, Aulis O., 4,546,132, Cl. 524-8.000.
Othman, Allan, 4,545,763, Cl. 432-78.000.

Oy Tampella AB: *See*—
Koivula, Jorma, 4,545,778, Cl. 474-153.000.

Oy Wartsila Ab: *See*—
Poutiainen, Heikki; and Malminen, Henrikki, 4,545,223, Cl. 70-38.00A.

Ozaki, Eiichi: *See*—
Nakao, Kazushige; Ikeuchi, Masaki; Ozaki, Eiichi; and Yumikura, Tsuneo, 4,545,217, Cl. 62-476.000.

Ozanne, Michel: *See*—
Marcadet, Luc; and Ozanne, Michel, 4,545,560, Cl. 251-58.000.

Ozari, Yehuda: *See*—
Gajria, Chandrasen; and Ozari, Yehuda, 4,546,014, Cl. 427-239.000.

Ozawa, Naomitsu: *See*—
Nishikiori, Kenji; and Ozawa, Naomitsu, 4,545,740, Cl. 417-317.000.

Ozawa, Takashi, to Fuji Xerox Co., Ltd. Reading, printing and copying device. 4,545,672, Cl. 355-3.00R.

Pa Ang, Peter G.: *See*—
Sammells, Anthony F.; and Pa Ang, Peter G., 4,545,872, Cl. 204-72.000.

Pabst, Josef: *See*—
Ciszewski, Hans-Joachim; Pabst, Josef; and Weisser, Hans-Joerg, 4,545,956, Cl. 422-28.000.

Pacho, Angel R.: *See*—
Alba, Emilio C.; and Pacho, Angel R., 4,546,306, Cl. 323-308.000.

Pacholok, David R.: *See*—
Pfaff, Ernest H.; Mowbray, Kenneth D.; and Pacholok, David R., 4,546,319, Cl. 324-460.000.

Pacific Scientific Company: *See*—
Yang, Elmer C., 4,545,322, Cl. 188-67.000.

Pagdin, Brian C.; and Marriage, David J., to Solex (U.K.) Limited. Air/fuel induction system for a multi-cylinder internal combustion engine. 4,545,345, Cl. 123-299.000.

Pall Corporation: *See*—
Tinker, Craig S., 4,546,442, Cl. 364-500.000.

Pallos, Ferenc M.: *See*—
Hyzak, Daniel L.; Pallos, Ferenc M.; and Hsu, Joanna K., 4,546,199, Cl. 560-165.000.

Palmberg, Ulf, to AB Gustaf Kahr. Method and plant in processing, particularly cutting up elongated objects such as timber. 4,546,440, Cl. 364-475.000.

Palmer, Kenneth J.: *See*—
Rye, Grover W.; and Palmer, Kenneth J., 4,545,190, Cl. 57-212.000.

Pan Canadian Petroleum Limited: *See*—
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., 4,545,892, Cl. 208-11.0LE.

Papantoniou, Christos: *See*—
Jacquet, Bernard; Papantoniou, Christos; and Gaetani, Quintino, 4,545,981, Cl. 424-61.000.

Parker-Hannifin Corporation: *See*—
Middlekauff, Carle A., 4,545,748, Cl. 418-61.00B.

Parquier, Guy L.: *See*—
Petitjean, Christian; and Parquier, Guy L., 4,546,356, Cl. 343-18.00E.

Parris, David, to Imperial Chemical Industries Australia Limited. Process for the manufacture of methyl t-butyl ether. 4,546,204, Cl. 568-697.000.

Parsons, Robert C., to Reynolds Metals Company. Method for adhesive bonding of aluminum. 4,545,842, Cl. 156-310.000.

Parthasarathi, Thiruvenkata R., to Compmail Systems, Inc. Chopper for an envelope stuffing machine. 4,545,178, Cl. 53-435.000.

Pasquazzi, Henry; and Pasquazzi, Henry, Jr. Curb lifting device. 4,545,609, Cl. 294-104.000.

Pasquazzi, Henry, Jr.: *See*—
Pasquazzi, Henry; and Pasquazzi, Henry, Jr., 4,545,609, Cl. 294-104.000.

Pastan, Ira; Willingham, Mark C.; and Fitzgerald, David J., to United States of America, Health and Human Services. Pseudomonas exotoxin conjugate immunotoxins. 4,545,985, Cl. 424-85.000.

Paul, Kermit D.; Addams, Charles F., Jr.; and Wuertele, Frederick S., to Cyclonaire Corporation. System for transferring dry flowable material. 4,545,410, Cl. 141-18.000.

Paulus, Wilfried: *See*—
Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, 4,545,994, Cl. 514-514.000.

Pauze, Denis R.: *See*—
Keane, John J.; and Pauze, Denis R., 4,546,041, Cl. 428-372.000.

Pearce, Arthur W. Hay bale feeder. 4,545,716, Cl. 414-24.600.

Pearl, David R., to Gerber Garment Technology, Inc. Blade for severing fibrous material. 4,545,275, Cl. 83-747.000.

Pearman, Bruce W.; Pelton, Clark; Roper, Todd K.; and Tivis, Layne C., to Showdown Electronics, Inc. Electronic gun and target apparatus and method. 4,545,583, Cl. 273-311.000.

Peciar, Jozef: *See*—
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

Pecoraro, George A.: *See*—
Won, Kwang J.; and Pecoraro, George A., 4,545,800, Cl. 65-134.000.

Peddinghaus, Rolf. Multitool punching apparatus. 4,545,233, Cl. 72-404.000.

Pedersen, David R.: *See*—
Caldwell, Stephen P.; and Pedersen, David R., 4,546,268, Cl. 307-265.000.

Pedlick, John S.: *See*—
Cerwin, Robert J.; and Pedlick, John S., 4,545,377, Cl. 128-325.000.

Pedrotty, Douglas G.: *See*—
Renalls, Brenda L.; Pedrotty, Douglas G.; and Donlan, John F., 4,546,036, Cl. 428-323.000.

Peerman, Dwight E.; DiDomenico, Edward; Frisch, Kurt C.; and Meffert, Alfred, to Henkel Corporation. Urethane forming compositions based on fatty polyols. 4,546,120, Cl. 521-159.000.

Pelletier, Charlie: *See*—
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Pelton, Clark: *See*—
Pearman, Bruce W.; Pelton, Clark; Roper, Todd K.; and Tivis, Layne C., 4,545,583, Cl. 273-311.000.

Pemberton, J. C. Phosphorescent flash-light. 4,546,416, Cl. 362-84.000.

Pena-Finol, Jesus S.; and Connelly, Joseph A., to Georgia Tech Research Institute. Quarter-square analog four-quadrant multiplier using MOS integrated circuit technology. 4,546,275, Cl. 307-498.000.

Penco, Eugenio: *See*—
Bagaglia, Adriano; Marchetti, Renato; and Penco, Eugenio, 4,546,482, Cl. 372-86.000.

Pennwalt Corporation: *See*—
King, James P., 4,545,973, Cl. 423-512.00R.
Sandler, Stanley R., 4,546,205, Cl. 568-421.000.

Pentad Corp.: *See*—
Stagg, George A., Jr., 4,545,578, Cl. 273-144.00B.

Pentel Kabushiki Kaisha: *See*—
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Perennatorwerk Alfred Hagen GmbH: *See*—
Flackett, Dale R.; Jonas, Reinhard; and Trego, Brian R., 4,546,017, Cl. 427-387.000.

Perez, Paul S. Sprinkler control system. 4,545,528, Cl. 239-1.000.
Perino, Didier: *See*—
Lewiner, Jacques; Perino, Didier; and Hennion, Claude, 4,546,257, Cl. 250-388.000.
Perkin-Elmer Corporation, The: *See*—
Markle, David A., 4,545,683, Cl. 356-400.000.
Perlegos, George: *See*—
Gupta, Anil; and Perlegos, George, 4,546,454, Cl. 365-200.000.
Perlson, Bruce D.: *See*—
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Perrot, Alexander: *See*—
Schanz, Friedrich; Schucker, Emil; and Perrot, Alexander, 4,545,532, Cl. 239-242.000.
Perrot-Regnerbau GmbH & Co.: *See*—
Schanz, Friedrich; Schucker, Emil; and Perrot, Alexander, 4,545,532, Cl. 239-242.000.
Persson, Carl G. A.: *See*—
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Pervier, James W.: *See*—
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Peters, John W.: *See*—
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Peters, Klaus-Jurgen: *See*—
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Peters, Manfred: *See*—
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Peters, Wolfram J. P.: *See*—
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Peterson, Francis C.: *See*—
Rodseth, William G.; and Peterson, Francis C., 4,546,408, Cl. 361-386.000.
Peterson, Warren J., to Joerns Healthcare, Inc. Modular drive arrangement for adjustable beds and the like. 4,545,084, Cl. 5-69.000.
Peterson, William J.; and Faulkner, Dennis T., to Sundstrand Corporation. Motor control for a brushless DC motor. 4,546,293, Cl. 318-254.000.
Petitjean, Christian; and Parquier, Guy L., to LMT-Radio Professionnelle. Process for the protection of a radar against jamming and radar for putting this process into effect. 4,546,356, Cl. 343-18.00E.
Petkanchin, Lyubomir T.: *See*—
Marinov, Mihail T.; Petkanchin, Lyubomir T.; Pushev, Georgi I.; Kostov, Georgi T.; Mihovski, Mitko M.; and Manolova, Valentina A., 4,545,252, Cl. 73-633.000.
Petrie, Dennis J.; and Hastings, Jerome K., to Eaton Corporation. Residential circuit breaker with combination slot motor and arc chute. 4,546,336, Cl. 335-16.000.
Petrie, Dennis J.; Bridges, Robert B.; Grass, William E.; and Hastings, Jerome K., to Eaton Corporation. Residential circuit breaker with one piece slot motor. 4,546,337, Cl. 335-16.000.
Petro-Canada Inc.: *See*—
Cymbalisty, Lubomyr M. O.; and Cymerman, George J., 4,545,892, Cl. 208-11.0LE.
Pettersson, Stig. Combined lift fork and bucket device for attachment to a vehicle. 4,545,721, Cl. 414-724.000.
Peyton, John J.; and Watt, Bryan K., to Industrial Automation Corp. Chipped neck inspector. 4,546,247, Cl. 250-223.00B.
Pfaff, Ernest H.; Mowbray, Kenneth D.; and Pacholok, David R. Vacuum testing method and apparatus. 4,546,319, Cl. 324-460.000.
Pfitzner, Jorg: *See*—
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Pfizer Inc.: *See*—
Glazer, Edward A., 4,546,113, Cl. 514-636.000.
Pfluger, Gerhard, to Robert Bosch GmbH. Alternator with unitary brush-holder and bearing hub. 4,546,280, Cl. 310-68.00D.
Pharmuka Laboratoires: *See*—
Bondiou, Jean-Claude; Hodac, Francoise; and Legroux, Didier, 4,546,185, Cl. 546-133.000.
Phillips Petroleum Company: *See*—
Brand, Michael J.; and Callejas, Ricardo J., 4,545,895, Cl. 208-351.000.
Funk, Gary L.; and Bland, Terry E., 4,545,971, Cl. 423-359.000.
Porter, Randall A.; and Reed, Larry E., 4,545,893, Cl. 208-48.00R.
Railsback, Henry E., 4,545,927, Cl. 252-511.000.
Stewart, William S.; and Blaesi, John E., 4,545,894, Cl. 208-311.000.
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Piccolo, Oreste; Villa, Giovanni; and Zen, Enrico, to Blaschim S.p.A. Process for the optical resolution of (±)2-(6'methoxy-2'-naphthyl)-propionic acid. 4,546,201, Cl. 562-401.000.
Pickett, John A.: *See*—
Dawson, Glenn W.; Griffiths, David C.; and Pickett, John A., 4,546,110, Cl. 514-529.000.
Piesik, Edward T., to General Dynamics Pomona Division. Protection device for rocket launcher rail. 4,545,284, Cl. 89-1.819.
Pignal, M.: *See*—
Barriquand, B.; Villard, F.; Martin, M.; Tridon, M.; and Pignal, M., 4,545,135, Cl. 34-58.000.
Pilpel, Edward D.: *See*—
Meatto, Franklin D.; and Pilpel, Edward D., 4,545,597, Cl. 280-610.000.
Pinches, Anthony: *See*—
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,545,909, Cl. 210-618.000.
Pincus, Ivo R., to Harrisons & Crosfield. Hydrocyclones. 4,545,899, Cl. 209-211.000.
Pinson, George T., to Boeing Company, The. Relating cellular energy generating and storage device. 4,546,264, Cl. 290-54.000.
Pioneer Video Corporation: *See*—
Isobe, Teruhiko, 4,546,461, Cl. 369-50.000.
Pipa, William J.; and Turbowitz, Leslie D., to Azrak-Hamway International, Inc. Toy vehicle with an automatic transmission. 4,545,451, Cl. 180-70.100.
Pirschel, Joerg, to Siemens Aktiengesellschaft. Ultrasound examination device for scanning body parts. 4,545,385, Cl. 128-660.000.
Pitha, Josef, to United States of America, Health and Human Services. Saponin-based polyether polyols, pharmaceutical compositions and a method of using same. 4,546,097, Cl. 514-26.000.
Pitt, Caryl S.: *See*—
Rhodes, William H.; Pitt, Caryl S.; and Gutta, John J., 4,545,799, Cl. 65-59.210.
Place, Thomas M., Jr.; and Crawford, James A., Jr., to Ford Aerospace & Communications Corporation. Woven ceramic composite heat exchanger. 4,545,429, Cl. 165-169.000.
Platek, Stanley W.; Desautels, S. Jerry; and Szczypiorski, Wojtek, to Hazelett Strip-Casting Corporation. Refractory coating of edge-dam blocks for the purpose of preventing longitudinal bands of sinkage in the product of a continuous casting machine. 4,545,423, Cl. 164-481.000.
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Lindner, Daniel J.; Loeffler, Ronald L.; Fetty, Harold D.; and Plauny, Jeffrey L., 4,545,415, Cl. 152-209.00R.
Plewan, Otto: *See*—
Engelmann, Manfred; Plewan, Otto; Kraus, Helmut; and Klippert, Heinz, 4,546,135, Cl. 524-158.000.
Plotkin, Elliot V.: *See*—
Higgins, Irving J.; Hill, Hugh A. O.; and Plotkin, Elliot V., 4,545,382, Cl. 128-635.000.
Plotnick, Michael A.: *See*—
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Plough, Inc.: *See*—
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Pocheau, Jean-Marc: *See*—
Favrel, Jean-Paul; Ouss, Jean; and Pocheau, Jean-Marc, 4,546,469, Cl. 370-77.000.
Poe, James T. Filter backwash water saver and water filter to clean swimming pool filter. 4,545,905, Cl. 210-136.000.
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Eidenschink, Rudolf; and Pohl, Ludwig, 4,545,922, Cl. 252-299.630.
Polaroid Corporation: *See*—
Bronstein-Bonte, Irena Y.; and Lindholm, Edward P., 4,546,062, Cl. 430-215.000.
Douglas, Lawrence M., 4,545,663, Cl. 354-304.000.
Fantone, Stephen D.; and Johnson, Bruce K., 4,545,655, Cl. 350-540.000.
Shulman, Joseph; and Clifford, David L., 4,545,648, Cl. 350-337.000.
Taylor, Lloyd D., 4,546,159, Cl. 526-286.000.
Pollard, Michael D.: *See*—
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Polychrome Corporation: *See*—
Riley, Donald J., 4,545,875, Cl. 204-129.400.
Polyfab S.A.R.L.: *See*—
Rizk, Jihad F., 4,545,158, Cl. 52-79.100.
Rizk, Jihad F., 4,545,159, Cl. 52-79.900.
Rizk, Jihad F., 4,545,169, Cl. 52-601.000.
Poncept, Gerard. Apparatus for blood analysis. 4,545,237, Cl. 73-61.400.
Portat, Michel J.: *See*—
Chatanier, Michel J.; Portat, Michel J.; and Bruere, Alain E., 4,546,310, Cl. 324-52.000.
Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, to Northern Telecom Limited. Pulp insulated telecommunications conductor. 4,545,858, Cl. 162-267.000.
Porter, Randall A.; and Reed, Larry E., to Phillips Petroleum Company. Antifoulants for thermal cracking processes. 4,545,893, Cl. 208-48.00R.
Post, Hendrik A.: *See*—
Wolf, Joost M.; Post, Hendrik A.; Stigter, Willem H.; van der Brug, Gerard J.; and Sieben, Joannes H. F. C., 4,545,550, Cl. 242-200.000.
Poutiainen, Heikki; and Malminen, Henrikki, to Oy Wartsila Ab. Padlock. 4,545,223, Cl. 70-38.00A.
Powered Platforms Mfg.: *See*—
Crudele, Richard E., 4,545,558, Cl. 248-544.000.
Powers, Larry J.: *See*—
Pyne, William J.; Lowbridge, John; Chang, In-Kook; Knotz, Florian; and Powers, Larry J., 4,545,810, Cl. 71-92.000.
PowerSafety International, Inc.: *See*—
Schoessow, Glen J., 4,545,766, Cl. 434-218.000.
PPG Industries, Inc.: *See*—
Bay, Paul G.; Boyer, Nicodemus E.; and Sienkowski, Kenneth J., 4,546,139, Cl. 524-367.000.
Elias, Richard C., 4,546,045, Cl. 428-424.600.

Griffiths, David H.; and Wright, Larry G., 4,546,485, Cl. 373-28.000.
Matesa, Joseph M., 4,545,798, Cl. 65-27.000.
Won, Kwang J.; and Pecoraro, George A., 4,545,800, Cl. 65-134.000.

Pralus, Christian, to Atochem. Stabilization of aqueous solutions containing hydrogen peroxide, hydrofluoric acid and metal ions. 4,545,918, Cl. 252-142.000.

Prave, Paul; and Sittig, Wolfgang, to Hoechst Aktiengesellschaft. Process for improving the gas distribution in air-lift loop reactors. 4,545,945, Cl. 261-36.00R.

Previdoli, Felix; and Tenud, Leander, to Lonza Ltd. Process for the producton of 4-substituted acetoacetic acid derivatives. 4,545,934, Cl. 260-239.00E.

Prew, Stanley R., to Koppers Company, Inc. Hog granulator. 4,545,538, Cl. 241-73.000.

Prewitt, William T.; and Van Dyke, James A., to Goodyear Tire & Rubber Company, The. Rheometer and process of curing and testing rubber. 4,546,438, Cl. 364-473.000.

Prime, Robert B.: *See—*
Ko, Ming; Oxsen, Michael E.; and Prime, Robert B., 4,546,035, Cl. 428-315.900.

Procter & Gamble Company, The: *See—*
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Prohofsky, LeRoy A.; and Hanson, David G., to Sperry Corporation. Local zoom for raster scan displays. 4,546,349, Cl. 340-731.000.

Protectaire Systems Co.: *See—*
Russell, Frederick E., 4,545,295, Cl. 98-115.200.

Prunty, Pleasant A.: *See—*
Schantz, Robert E.; McCune, James D.; and Prunty, Pleasant A., 4,545,361, Cl. 126-226.000.

Psi Star: *See—*
Nelson, Norvell J., 4,545,850, Cl. 156-642.000.

Pugnaire, Jean-Pierre A., to Environmental Control Technology, Inc. Low pressure transducer. 4,545,255, Cl. 73-726.000.

Puhringer, Othmar: *See—*
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; Zajicek, Ernst; and Puhringer, Othmar, 4,546,483, Cl. 373-24.000.

PUMA-Sportschuhfabriken Rudolf Dassler KG: *See—*
Adam, Gunter, 4,545,584, Cl. 273-73.00J.

Punakivi, Tapio, to Rauma-Repola Oy. Gate for barking drum and method of closing. 4,545,503, Cl. 220-345.000.

Purdue Research Foundation: *See—*
Janick, Jules; and Kononowicz, Halina M., 4,545,147, Cl. 47-58.000.

Pushev, Georgi I.: *See—*
Marinov, Mihail T.; Petkanchin, Lyubomir T.; Pushev, Georgi I.; Kostov, Georgi T.; Mihovski, Mitko M.; and Manolova, Valentina A., 4,545,252, Cl. 73-633.000.

Puxley, David C.: *See—*
Sheppard, Christine M.; Puxley, David C.; Banks, Reginald G. S.; and McKenzie, Donald, 4,546,091, Cl. 502-84.000.

PVI Industries, Inc.: *See—*
Adams, Charles L., 4,545,329, Cl. 122-17.000.

Pyne, William J.; Lowbridge, John; Chang, In-Kook; Knotz, Florian; and Powers, Larry J., to SDS Biotech Corporation. Herbicidal and plant growth regulant diphenylpyridazinones. 4,545,810, Cl. 71-92.000.

Pyromid, Inc.: *See—*
Hait, Paul W., 4,545,359, Cl. 126-9.00R.

Quon, Joe S., to Multi-Tex Products Corp. Product having combined phosphorescent-reflective appearance and method. 4,546,042, Cl. 428-378.000.

R. J. Reynolds Tobacco Co.: *See—*
Sensabaugh, Andrew J., Jr.; Crepps, Dewitt C.; Rice, William Y., Jr.; and Fearrington, George W., Jr., 4,545,392, Cl. 131-352.000.

R. P. Scherer Corporation: *See—*
Bateman, Neil E.; and Woods, Ross A., 4,546,197, Cl. 560-66.000.

Racal-SES Limited: *See—*
Naylor, Michael; and Latham, Robert, 4,546,470, Cl. 370-97.000.

Radovich, David A.; and Lowery, Michael K., to Mobay Chemical Corporation. Flexible polyurethane foams. 4,546,122, Cl. 521-164.000.

Railsback, Henry E., to Phillips Petroleum Company. Conductive (hard) rubber compositions. 4,545,927, Cl. 252-511.000.

Rampf Foreman GmbH: *See—*
Scheidt, Joachim; and Keller, Gottfried, 4,545,754, Cl. 425-419.000.

Rand, Robert W.; Snow, Harold D.; Elliott, David G.; and Haskins, Glenn M. Induction heating method for use in causing necrosis of neoplasm. 4,545,368, Cl. 128-1.300.

Randleman, Randy J. Maze game device. 4,545,577, Cl. 273-113.000.

Rappas, Alkis S., to Standard Oil Co., The. Processes relating to the extraction of metals from laterites and ocean manganese nodules. 4,545,816, Cl. 75-101.00R.

Raschke, Curt R.: *See—*
Fischbeck, Kenneth H.; Creagh, Linda T.; and Raschke, Curt R., 4,546,360, Cl. 346-1.100.

Rastogi, Prabhat K., to Inland Steel Company. Low silicon steel electrical lamination strip. 4,545,827, Cl. 148-31.550.

Rattner, Manfred: *See—*
Kuhnke, Hermann; and Rattner, Manfred, 4,546,489, Cl. 378-103.000.

Rau, Axel; and Franz, Klaus-Dieter, to Merck Patent Gesellschaft mit beschrankter Haftung. Dispersible Berlin blue pigment. 4,545,821, Cl. 106-291.000.

Rauma-Repola Oy: *See—*
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Ravaux, Gilles: *See—*
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Ravet, Jean-Paul: *See—*
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Ray, Claude; and Schaeren, Walter, to Asuag-SSIH. Watch case having synthetic material seals between detachable parts thereof. 4,545,688, Cl. 368-291.000.

Ray, Harold T.: *See—*
Connolly, Walter L.; and Ray, Harold T., 4,545,231, Cl. 72-335.000.

Ray, K. Bruce: *See—*
Miller, Richard N.; and Ray, K. Bruce, 4,545,396, Cl. 137-78.300.

Raychem Corporation: *See—*
Fouts, Robert W., Jr.; Au, Andrew N. S.; Miller, Burton E.; and Gotcher, Alan J., 4,545,926, Cl. 252-511.000.

RCA Corporation: *See—*
Blackstone, Scott C.; Jastrzebski, Lubomir L.; and Corboy, John F., Jr., 4,546,375, Cl. 357-23.400.
Dackow, Paul N., 4,546,487, Cl. 377-51.000.
Gibson, Walter G.; Plotnick, Michael A.; and Chen, Thomas Y., 4,546,389, Cl. 358-342.000.
Kern, Werner, 4,546,016, Cl. 427-255.300.
Knop, Karl H., 4,546,380, Cl. 358-43.000.
Reichert, Walter F., 4,545,109, Cl. 29-571.000.

Rebsamen, August; and Low, Martin, to SIG Schweizerische Industrie-Gesellschaft. Method and apparatus for producing packages. 4,545,179, Cl. 53-443.000.

Redmond, Daniel R. Glass filled plastic hinge. 4,545,090, Cl. 16-385.000.

Redwine, Fletcher H., to United States Steel Corporation. Bonded valve with replaceable insert. 4,545,404, Cl. 137-516.290.

Reed Industries, Inc.: *See—*
Mueller, Richard J.; and Chow, Edmund E., 4,545,505, Cl. 222-65.000.

Reed, Larry E.: *See—*
Porter, Randall A.; and Reed, Larry E., 4,545,893, Cl. 208-48.00R.

Reeder, Bruce L.: *See—*
Ridgley, James R.; and Reeder, Bruce L., 4,545,474, Cl. 194-1.00E.

Regelman, Dale F.: *See—*
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Regie Nationale des Usines Renault: *See—*
Jourde, Jean-Pierre; Cmapo-Garraza, Pedro; Miettaux, Marc; and Michaux, Thierry, 4,545,352, Cl. 123-447.000.

Rehrer, David H.: *See—*
Rossi, Albert; Rehrer, David H.; Oswald, Alexis A.; Lewtas, Kenneth; and Tack, Robert D., 4,546,137, Cl. 524-217.000.

Reichert, Walter F., to RCA Corporation. Method of making a gallium arsenide field effect transistor. 4,545,109, Cl. 29-571.000.

Reichl, Richard: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Traunecker, Werner; and Reichl, Richard, 4,546,102, Cl. 514-259.000.

Reinhold, Holger, to TAMPOflex GmbH. Ink applicator for a tampon printing machine. 4,545,301, Cl. 101-163.000.

Reinking, Klaus: *See—*
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, 4,546,138, Cl. 524-326.000.
Zecher, Wilfried; Dunwald, Willi; Merten, Rudolf; and Reinking, Klaus, 4,546,162, Cl. 528-67.000.

Reliance Electric Company: *See—*
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Renalls, Brenda L.; Pedrotty, Douglas G.; and Donlan, John F., to Minnesota Mining and Manufacturing Company. Magnetic recording medium having opaque polyester film base. 4,546,036, Cl. 428-323.000.

Renardus, Max L. P.; and Sieswerda, Bauke, to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp. 4,546,284, Cl. 313-25.000.

Renshaw, Theodore A.; and Curatolo, Joseph A., Jr., to Fairchild Industries, Inc. Method and apparatus for preventing tip sticking during welding operation. 4,545,519, Cl. 228-1.100.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Traunecker, Werner; and Reichl, Richard, to Boehringer Ingelheim KG. 1-(6,7-Dimethoxyquinazol-4-yl)semicarbazides. 4,546,102, Cl. 514-259.000.

REPA Feinstanzwerk GmbH: *See—*
Wier, Franz, 4,545,097, Cl. 24-642.000.

Repin, Boris N. Aeration tank. 4,545,907, Cl. 210-195.100.

Repligen Corporation: *See—*
Herlihy, Walter C.; Epstein, David M.; and Felger, Carl B., 4,546,096, Cl. 514-25.000.

Rescalli, Carlo: *See—*
Gazzi, Luigi; Rescalli, Carlo; Scaramucci, Maria A.; and Ginnasi, Alessandro, 4,545,965, Cl. 423-229.000.

Research Corporation: *See—*
Malley, Arthur, 4,545,986, Cl. 424-85.000.

Retallick, William B. Catalytic combustor having spiral shape. 4,545,430, Cl. 166-59.000.

Reuter, Edward J., to Reuter, Inc. Refuse container having an upper rolled lip portion and cooperating cover. 4,545,502, Cl. 220-334.000.

Reuter, Inc.: *See—*
Reuter, Edward J., 4,545,502, Cl. 220-334.000.

Reutler, Herbert: *See—*
Ullrich, Manfred; Reutler, Herbert; and Schepers, Hubert, 4,545,954, Cl. 376-220.000.

Reynolds, George H.; Elsner, Norbert B.; and Shearer, Clyde H., to United States of America, National Aeronautics and Space Administration. Stabilized lanthanum sulphur compounds. 4,545,967, Cl. 423-263.000.

Reynolds Metals Company: *See*—
Parsons, Robert C., 4,545,842, Cl. 156-310.000.

Rhee, Khee C.; and Lusas, E. W., to Texas A&M University System, The. Method of producing low-gossypol cottonseed protein material. 4,546,004, Cl. 426-656.000.

Rheinmetall GmbH: *See*—
Furch, Benjamin; and Rost, Friedrich-Wilhelm, 4,545,755, Cl. 425-420.000.

Rhodes, William H.; Pitt, Caryl S.; and Gutta, John J., to GTE Laboratories Incorporated; and GTE Products Corporation. Method of making direct seal between niobium and ceramics. 4,545,799, Cl. 65-59.210.

Rhone-Poulenc Chimie de Base: *See*—
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Rhone-Poulenc Inc.: *See*—
Gradeff, Peter S.; Charte, Vincent J.; Schreiber, Fred G.; and Davison, John F., 4,545,923, Cl. 252-309.000.

Rhone-Poulenc Sante: *See*—
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Rice, Ivan G. Process for directing a combustion gas stream onto rotatable blades of a gas turbine. 4,545,197, Cl. 60-39.050.

Rice, William Y., Jr.: *See*—
Sensabaugh, Andrew J., Jr.; Crepps, Dewitt C.; Rice, William Y., Jr.; and Fearrington, George W., Jr., 4,545,392, Cl. 131-352.000.

Rich, Stanley R.: *See*—
Sachar, Kenneth S.; and Rich, Stanley R., 4,545,525, Cl. 239-3.000.

Richards, James, to Commonwealth of Australia, The. Pulse transmission or reflection mode laser. 4,546,477, Cl. 372-12.000.

Richards, Jimmy L., to Goodyear Tire & Rubber Company, The. Reinforcing element for elastomeric articles and elastomeric made thereof. 4,546,031, Cl. 428-222.000.

Richards, Michael A., to S.G. Owen Limited. Selective plating. 4,545,864, Cl. 204-15.000.

Richey, Clyde D., to Jacobs Manufacturing Co., The. Tool chest with retractable step. 4,545,628, Cl. 312-235.00A.

Richter, Stanley J.: *See*—
Wehnert, George J.; and Richter, Stanley J., 4,545,837, Cl. 156-191.000.

Richter, Uwe; and Kellershofen, Hans, to GKSS-Forschungszentrum Geesthacht GmbH; and H. Lorenz GmbH. Device for treating the surfaces of structures and ships. 4,545,317, Cl. 114-222.000.

Rickel, William R.: *See*—
Bozoarth, David B.; and Rickel, William R., 4,545,947, Cl. 264-150.000.

Ridders, Johannes A. M.: *See*—
Van Gils, Wilhelmus M. J.; Mollet, Adrianus J. T.; and Ridders, Johannes A. M., 4,545,774, Cl. 445-22.000.

Ridgley, James R.; and Reeder, Bruce L., to North American Philips Corporation. Mounting means and method of affixing a drop coin mechanism. 4,545,474, Cl. 194-1.00E.

Riebli, Peter: *See*—
Hubele, Adolf; and Riebli, Peter, 4,546,109, Cl. 514-493.000.

Riegler, Ernst: *See*—
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; Zajicek, Ernst; and Puhringer, Othmar, 4,546,483, Cl. 373-24.000.

Rieke, Brent E.: *See*—
Moring, Rodger L.; and Rieke, Brent E., 4,545,452, Cl. 180-88.000.

Rieman, Davis J.: *See*—
Mukerjee, Ajit K.; Kearns, Patrick J.; and Rieman, Davis J., 4,545,134, Cl. 34-27.000.

Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., to General Foods Corporation. 3-Hydroxy-4-methoxyphenyl aryl carbonates. 4,545,999, Cl. 426-548.000.

Riemer, Jed A.: *See*—
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., 4,546,000, Cl. 426-548.000.

Riley, Donald J., to Polychrome Corporation. Electrolytic graining. 4,545,875, Cl. 204-129.400.

Ring Around Products, Inc.: *See*—
Davis, William H., 4,545,146, Cl. 47-58.000.

Riss, Wilfried: *See*—
Spitaler, Engelbert; Oberleitner, Gerhard; Svoboda, Josef; Nitschko, Theodor; and Riss, Wilfried, 4,545,598, Cl. 280-612.000.

Ritter, George W., II, to Owens-Corning Fiberglas Corporation. Production of a magnesium chloride gel system useful in ceramics and fiber production. 4,545,924, Cl. 252-315.700.

Rizk, Jihad F., to Polyfab S.A.R.L. Interior wall structure for a transportable building module. 4,545,158, Cl. 52-79.100.

Rizk, Jihad F., to Polyfab S.A.R.L. Modular building system and building modules therefor. 4,545,159, Cl. 52-79.900.

Rizk, Jihad F., to Polyfab S.A.R.L. Prefabricated transportable concrete floor system and method for producing same. 4,545,169, Cl. 52-601.000.

Robatel: *See*—
Barriquand, B.; Villard, F.; Martin, M.; Tridon, M.; and Pignal, M., 4,545,135, Cl. 34-58.000.

Robert Bosch GmbH: *See*—
Armbruster, Gerhard; Schadlich, Fritz; and Seidel, Eberhard, 4,545,121, Cl. 30-374.000.
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,545,353, Cl. 123-454.000.
Hofmann, Karl; and Trachte, Dietrich, 4,545,530, Cl. 239-73.000.
Holl, Walter, 4,546,400, Cl. 361-1.000.
Jaggle, Gunther; and Schonemann, Walter, 4,545,354, Cl. 123-470.000.
Kubach, Hans, 4,546,339, Cl. 335-230.000.
Leiber, Heinz, 4,545,240, Cl. 73-146.000.
Maier, Gernot; Tischler, Heinrich; Wohr, Rolf; and Schwarzhoff, Wolfgang, 4,545,632, Cl. 339-18.00R.
Pfluger, Gerhard, 4,546,280, Cl. 310-68.00D.

Robertson, John R., to ICI Americas Inc. Process for forming mold releasable polyurethane, polyurea and polyureaurethane resins using isocyanate reactive polysiloxanes as internal mold release agents. 4,546,154, Cl. 525-474.000.

Robillard, Daniel: *See*—
Van Uffelen, Jean-Pierre H.; Robillard, Daniel; and LeBourg, Michel, 4,546,326, Cl. 330-129.000.

Rochman, Tzur. Protective means for neutralizing the operation of a motor vehicle having automatic transmission. 4,545,459, Cl. 180-287.000.

Rockefeller University, The: *See*—
Fishman, Jack; and Mayairi, Shinichi, 4,546,098, Cl. 514-177.000.

Rockerath, John L.; and Blust, Dale K., to Figge International, Inc. Fabric handling apparatus and method. 4,545,544, Cl. 242-55.000.

Rockwell International Corporation: *See*—
Niemiro, Josef W.; and Skipor, Eugene, 4,545,782, Cl. 493-425.000.

Rodda, Donald: *See*—
Giaimo, Anthony; Larsen, Robert H.; and Rodda, Donald, 4,545,311, Cl. 112-254.000.

Rodseth, William G.; and Peterson, Francis C., to Illinois Tool Works Inc. Electrically insulated heat sink assemblies and insulators used therein. 4,546,408, Cl. 361-386.000.

Rodyne Limited: *See*—
Burke, Alun, 4,545,288, Cl. 92-5.00R.

Roe, James E.: *See*—
Gellman, Gary; Erfurt, George A.; and Roe, James E., 4,546,001, Cl. 426-549.000.

Roger, Paul: *See*—
Lyskawa, Edmond; Roger, Paul; Marquis, Jean; and Canivez, Etienne, 4,545,860, Cl. 201-41.000.

Rogers, Bernard J. D. Articulated mounting means for poles, antennas and the like. 4,545,557, Cl. 248-516.000.

Rogers Corporation: *See*—
Simpson, Scott S.; Yeznach, Anthony; and Barton, Carlos L., 4,546,118, Cl. 521-130.000.

Rogers, Richard B.: *See*—
Arndt, Kim E.; Rogers, Richard B.; and McCormick, Ronald W., 4,545,803, Cl. 71-27.000.
McCormick, Ronald W.; and Rogers, Richard B., 4,545,802, Cl. 71-27.000.

Rogers, William R.; and Lieschedit, Duane B., to Gerber Products Company. Equal spacing positioning apparatus. 4,545,125, Cl. 33-572.000.

Rohner, Benedikt, to Biella-Neher AG. Filing case. 4,545,484, Cl. 206-425.000.

Rohr Industries, Inc.: *See*—
Sankey, Edward M.; and Seaver, Randall J., 4,545,199, Cl. 60-226.200.

Rolls-Royce Ltd.: *See*—
England, David R., 4,545,874, Cl. 204-129.200.

Rolm Corporation: *See*—
Williams, Errol R., Jr., 4,546,388, Cl. 358-190.000.

Romero, Ysmael E.: *See*—
Kastan, B. Linn; and Romero, Ysmael E., 4,545,691, Cl. 384-458.000.

Romi, Giordano, to Industrias Romi S/A. Turning machine. 4,545,271, Cl. 82-32.000.

Romi, Romeu, to Industrias Romi S/A. Injection molding machines. 4,545,757, Cl. 425-593.000.

Roper, Todd K.: *See*—
Pearman, Bruce W.; Pelton, Clark; Roper, Todd K.; and Tivis, Layne C., 4,545,583, Cl. 273-311.000.

Rose, Jochen, to ITT Industries, Inc. Multi-stage rotary switch with a variable control-span restriction. 4,546,219, Cl. 200-11.00R.

Rosemount Inc.: *See*—
Coursolle, Thomas P., 4,545,258, Cl. 73-861.220.

Rosenberg, William E., to Columbia Chemical Corporation. Aqueous acid plating bath and brightener composition for producing bright electrodeposits of tin. 4,545,870, Cl. 204-54.00R.

Rosenburg, Dale W., to A. E. Staley Manufacturing Company. Cometathesis of triglycerides and ethylene. 4,545,941, Cl. 260-410.700.

Ross, Donald B.: *See*—
Giles, George B.; Ross, Donald B.; McCallion, Joseph J.; and Sherritt, William C., 4,545,759, Cl. 431-344.000.

Rossi, Albert; Rehrer, David H.; Oswald, Alexis A.; Lewtas, Kenneth; and Tack, Robert D., to Exxon Research & Engineering Co. Additive combinations and fuels containing them. 4,546,137, Cl. 524-217.000.

Rost, Friedrich-Wilhelm: *See*—
Furch, Benjamin; and Rost, Friedrich-Wilhelm, 4,545,755, Cl. 425-420.000.

Rost, Karl H. Textile yarn carrier. 4,545,222, Cl. 68-198.000.

Rotblum, Yehuda: *See*—
Freyman, Ronald L.; and Rotblum, Yehuda, 4,546,276, Cl. 307-578.000.

Rotesco Limited: *See*—
Lang, John G., 4,546,316, Cl. 324-262.000.

Roth, George: *See—*
Henes, Martin E.; and Roth, George, 4,545,603, Cl. 281-21.00A.
Rothfuss, Hans; Wieland, Gunter; and Schreiter, Peter, to Didier-Werke AG. Unfired refractory structural member in the form of a plate for use as an expendable lining of metallurgical vessels. 4,545,568, Cl. 266-280.000.
Roudebush, Brooks: *See—*
Galbreath, Donald E.; Roudebush, Brooks; and O'Donnell, Robert N., 4,545,523, Cl. 232-43.100.
Rout, Ivan P.; and Gillings, Christopher, to FBC Limited. Pesticidal composition and use. 4,546,108, Cl. 514-464.000.
Rowan, Paul D., to Umbra Shades Ltd. Clock construction. 4,545,687, Cl. 368-232.000.
Rudolf, Alain. Camera handle with retractable bipod support. 4,545,660, Cl. 354-82.000.
Ruellan, Andre , to C. Delachaux. Suspension system for an overhead contact wire for electric traction vehicles. 4,546,218, Cl. 191-40.000.
Ruhrgas Aktiengesellschaft: *See—*
Kuhn, Friedhelm, 4,545,208, Cl. 60-648.000.
Rundo, John R., to B. F. Goodrich Company, The. Tape winding apparatus. 4,545,549, Cl. 242-158.40R.
Russ, Julio G.; and Barrom, Donna L., to Plough, Inc. Method for making cosmetic pencils. 4,545,983, Cl. 424-63.000.
Russell, Frederick E., to Protectaire Systems Co. Sludge removal apparatus. 4,545,295, Cl. 98-115.200.
Russell, James T.: *See—*
Brenden, Bryon B.; and Russell, James T., 4,545,653, Cl. 350-432.000.
Russo, Joseph D.: *See—*
Lillibridge, Harold R.; and Russo, Joseph D., 4,545,846, Cl. 156-578.000.
Rutgerswerke Aktiengesellschaft: *See—*
Orth, Winfried; and Fickert, Werner, 4,546,190, Cl. 546-303.000.
Ryan, Edward J., to United Technologies Corporation. Composite tape preform for abradable seals. 4,546,047, Cl. 428-565.000.
Rye, Grover W.; and Palmer, Kenneth J., to Goodyear Tire & Rubber Company, The. Metallic cable and method and apparatus for making same. 4,545,190, Cl. 57-212.000.
Ryoke, Katsumi: *See—*
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Ryoke, Katsumi; and Tadokoro, Eiichi, 4,546,038, Cl. 428-323.000.
Ryu, Toshihiko, to NEC Corporation. Quadrature amplitude demodulator comprising a combination of a full-wave rectifying circuit and binary detectors. 4,546,323, Cl. 329-124.000.
Ryuzo, Mikami; and Nakasuji, Katsuyoshi, to Toray Silicone Co., Ltd. Coating composition and primer. 4,546,018, Cl. 427-407.200.
S. C. Johnson & Son, Inc.: *See—*
Brand, Julia A.; and Morgan, Lee W., 4,546,160, Cl. 526-320.000.
S.G. Owen Limited: *See—*
Richards, Michael A., 4,545,864, Cl. 204-15.000.
SACE S.p.A. Costruzioni Elettromeccaniche: *See—*
Mostosi, Angelo, 4,546,220, Cl. 200-50.0AA.
Mostosi, Angelo, 4,546,224, Cl. 200-153.00G.
Sachar, Kenneth S.; and Rich, Stanley R., to Micropure, Incorporated. Producing liquid droplets bearing electrical charges. 4,545,525, Cl. 239-3.000.
Sackner Products, Inc.: *See—*
Sandberg, Robert N.; and Montle, Robert E., 4,545,283, Cl. 87-6.000.
Safe-Air Inc.: *See—*
Barchechat, Shlomo; and Kolitsky, Norman, 4,545,363, Cl. 126-285.00B.
Safety Light Corporation: *See—*
Watts, David J., 4,546,417, Cl. 362-84.000.
Saft, S.A.: *See—*
Broussely, Michel; and Lecerf, Andre , 4,546,057, Cl. 429-218.000.
Saginaw Automation & Machine, Inc.: *See—*
Murphy, William J., 4,545,573, Cl. 269-328.000.
Saijo, Yoshihiro, to Nippon Achakutanshi Seizo Kabushiki Kaisha. Multi-contact connector. 4,545,634, Cl. 339-97.00P.
Saito, Isao: *See—*
Machida, Yoshimasa; Negi, Shigeto; Nomoto, Seiichiro; Kamiya, Takashi; Kitoh, Kyosuke; and Saito, Isao, 4,546,176, Cl. 544-21.000.
Saito, Junichi: *See—*
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,545,944, Cl. 260-545.00R.
Saito, Susumu: *See—*
Mori, Takaro; Saito, Susumu; and Fujii, Yasuhiko, 4,546,393, Cl. 360-40.000.
Saito, Takashi: *See—*
Ogasawara, Takaaki; Maruyama, Tokuji; Sato, Masaharu; Hida, Yukio; and Saito, Takashi, 4,546,234, Cl. 219-137.0PS.
Saitoh, Keishi; and Ando, Wataru, to Canon Kabushiki Kaisha. Method for forming a deposition film. 4,546,008, Cl. 427-38.000.
Sakai, Fumihide: *See—*
Konishi, Masataka; Sakai, Fumihide; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,546,084, Cl. 435-253.000.
Sakai, Koichi, to Toko Kabushiki Kaisha. Non-linear integration circuit. 4,546,274, Cl. 307-494.000.
Sakai, Masaaki; Sato, Kenji; and Yamagata, Seiichi, to Toray Industries, Inc. Artificial fur with guard hair fibers and under fur fibers. 4,546,020, Cl. 428-16.000.
Sakai, Shinji; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Signal circuit for an automatic focusing lens. 4,545,664, Cl. 354-400.000.
Sakakibara, Naoji: *See—*
Morioka, Hiroaki; and Sakakibara, Naoji, 4,545,563, Cl. 251-298.000.
Sakakibara, Shiro; and Hayakawa, Yoichi, to Aisin Warner Kabushiki Kaisha. Power transmission endless belt. 4,545,779, Cl. 474-240.000.
Sakamaki, Hiroshi; and Horikoshi, Yukio, to Nippon Piston Ring Co., Ltd. Vane-type rotary pump having two-piece side housings. 4,545,749, Cl. 418-173.000.
Sakamoto, Masaharu: *See—*
Kato, Kiichi; and Sakamoto, Masaharu, 4,545,651, Cl. 350-394.000.
Sakamoto, Masahiro: *See—*
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.
Sakamoto, Takurou: *See—*
Kamatani, Yoshio; and Sakamoto, Takurou, 4,546,153, Cl. 525-453.000.
Sakata, Teiichi: *See—*
Nakamura, Mitsugu; Yoshizu, Satoru; Sakata, Teiichi; and Yatabe, Hiroyuki, 4,545,627, Cl. 384-585.000.
Sako, Yoichiro; and Odaka, Kentaro, to Sony Corporation. Method of error correction. 4,546,474, Cl. 371-39.000.
Sakupa Color Products Corp.: *See—*
Shioi, Keiko; and Shoji, Yukito, 4,545,819, Cl. 106-23.000.
Sakurai, Kazuhiro: *See—*
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, 4,546,338, Cl. 335-229.000.
Sakurai, Yasuhiko: *See—*
Tanaka, Ryoichi; and Sakurai, Yasuhiko, 4,546,265, Cl. 307-10.0CS.
Salsby, Bernard: *See—*
Bennett, Julian; and Salsby, Bernard, 4,545,499, Cl. 215-352.000.
Salvi, Michel; Favennec, Pierre N.; and Gauneau, Marcel. Process for producing a GaAs or InP semiconductor by pre-implantation followed by transition metal diffusion. 4,545,824, Cl. 148-1.500.
Sammells, Anthony F.; and Pa Ang, Peter G., to Texaco Inc. Method for reducing carbon dioxide to provide a product. 4,545,872, Cl. 204-72.000.
Sandberg, Robert N.; and Montle, Robert E., to Sackner Products, Inc. Upholstery welt cord. 4,545,283, Cl. 87-6.000.
Sanden Corporation: *See—*
Sugimoto, Kazuo; Shimizu, Shigemi; and Terauchi, Kiyoshi, 4,545,746, Cl. 418-55.000.
Sanders Associates, Inc.: *See—*
Carl, Norman J., 4,545,326, Cl. 118-660.000.
Sanders, Bruce W.: *See—*
Christmas, Walter P.; and Sanders, Bruce W., 4,546,468, Cl. 370-54.000.
Sanderson, William R., to Interox Chemicals Limited. Particulate sodium perborate monohydrate containing adsorbed activator. 4,545,784, Cl. 8-107.000.
Sandler, Stanley R., to Pennwalt Corporation. Stabilization of aldehydes. 4,546,205, Cl. 568-421.000.
Sandvik Aktiebolag: *See—*
Wiredal, Harry A. I., 4,545,443, Cl. 175-258.000.
Sanity Saver Cap Company: *See—*
Wave, Larry E.; and Woods, Richard S., 4,546,346, Cl. 340-608.000.
Sankey, Edward M.; and Seaver, Randall J., to Rohr Industries, Inc. Fan cascade reverser having dual blocker doors. 4,545,199, Cl. 60-226.200.
Sankyo Company, Limited: *See—*
Nagano, Mitsuo; Hirai, Koichi; Kitamura, Kouichi; Shinkai, Kenkichi; and Yasuda, Hiroshi, 4,545,942, Cl. 260-465.00D.
Sankyo Dengyo Co., Ltd.: *See—*
Masuda, Hiroaki, 4,545,897, Cl. 209-135.000.
Sano, Nichiro; and Tsuno, Kazuhiko, to Asahi Yukizai Kogyo Co., Ltd. Diaphragm valve. 4,545,565, Cl. 251-331.000.
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, to Toa Grout Kogyo Co., Ltd.; Mitsui Toatsu Chemicals, Inc.; and Tonan Kaihatsu Kogyo Co., Ltd. Boring-injection device, method for improving ground by means of the device and method for investigating ground state by means of the device. 4,545,702, Cl. 405-269.000.
Sano, Tadashi, to Kabushiki Kaisha Suwa Seikosha. Electronic music note generator. 4,545,279, Cl. 84-1.260.
Sanshin Kogyo Kabushiki Kaisha: *See—*
Iio, Takeshi, 4,545,771, Cl. 440-89.000.
Nakahama, Ryoji; and Handa, Kenichi, 4,545,769, Cl. 440-61.000.
Sansui Electric Co., Ltd.: *See—*
Yamamoto, Takaaki, 4,546,394, Cl. 360-53.000.
Santrade Ltd.: *See—*
Bellmann, Bernhard G.; Birkner, Horst W.; and Kaminsky, Theo, 4,545,107, Cl. 29-568.000.
Sanyo Electric Co., Ltd.: *See—*
Himukai, Mamoru, 4,545,794, Cl. 55-362.000.
Sapru, Krishna: *See—*
Ovshinsky, Stanford R.; Sapru, Krishna; and Yee, Edmund L., 4,545,883, Cl. 204-192.0SP.
Sarja, Asko, to Sr-Kone Oy. Method and equipment for the compacting of concrete. 4,545,946, Cl. 264-70.000.
Sarofeen, Joseph J.; and Fischer, David M., to Welch Allyn, Inc. Independent color adjustment for a video system. 4,546,379, Cl. 358-42.000.

Sarumaru, Kazumasa. Apparatus for vulcanizing a tire. 4,545,750, Cl. 425-32.000.

Sasaki, Hiroaki; Nishiyama, Noboru; and Kamada, Akio, to Kawasaki Steel Corporation. Welding process using laser beam. 4,546,230, Cl. 219-121.0LD.

Sasaki, Isao: *See*—
Kishida, Kazuo; Sasaki, Isao; and Mukai, Nobuhiro, 4,546,145, Cl. 524-780.000.

Sasaki, Itsuo: *See*—
Suzuki, Yasoji; Sasaki, Itsuo; and Abou, Shouji, 4,546,327, Cl. 330-253.000.

Sasaki, Takehiko; and Koyama, Tamotsu, to Sharp Kabushiki Kaisha. Resilient interconnection for exchangeable liquid crystal panel. 4,545,647, Cl. 350-331.00R.

Sasaki, Tomoyuki: *See*—
Fujita, Shigeyoshi; Kiuchi, Naoyuki; Sasaki, Tomoyuki; and Fukuhara, Kazuyoshi, 4,545,303, Cl. 104-93.000.

Sassak, John J. Fluid suspended passenger carrying spherical body having universal attitude control. 4,545,574, Cl. 272-6.000.

Sato, Hideaki: *See*—
Tokuume, Yoshihiro; and Sato, Hideaki, 4,546,392, Cl. 360-30.000.

Sato, Hiromi: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Sato, Hiromi; Tanno, Norihiko; and Yoshida, Noboru, 4,545,936, Cl. 260-377.000.

Sato, Kenji: *See*—
Sakai, Masaaki; Sato, Kenji; and Yamagata, Seiichi, 4,546,020, Cl. 428-16.000.

Sato, Makoto; and Tsuch, Yoshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Monitoring circuit for an antilock braking system that detects a smaller diameter tire. 4,545,623, Cl. 303-92.000.

Sato, Masaharu: *See*—
Ogasawara, Takaaki; Maruyama, Tokuji; Sato, Masaharu; Hida, Yukio; and Saito, Takashi, 4,546,234, Cl. 219-137.0PS.

Sato, Mitsuru, to Kabushiki Kaisha Machida Seisakusho. Waterproof endoscope. 4,545,369, Cl. 128-4.000.

Sato, Shigetada, to Asahi Kogaku Kogyo Kabushiki Kaisha. Bright telephoto lens. 4,545,654, Cl. 350-454.000.

Sato, Takayuki, to Satosen Co., Ltd. Method of continuously casting steel. 4,545,424, Cl. 164-491.000.

Sato, Takuro: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,546,333, Cl. 333-202.000.

Satoh, Hirohisa, to Takara Co., Ltd. Dioramatic running toy. 4,545,777, Cl. 446-457.000.

Satoh, Isao: *See*—
Koishi, Kenji; Yoshida, Tomio; Satoh, Isao; and Ohara, Shunji, 4,546,462, Cl. 369-53.000.

Satoh, Seio: *See*—
Yasuda, Yoshichiro; and Satoh, Seio, 4,545,244, Cl. 73-195.000.

Satosen Co., Ltd.: *See*—
Sato, Takayuki, 4,545,424, Cl. 164-491.000.

Sattelmeyer, Richard: *See*—
Weil, Joachim; and Sattelmeyer, Richard, 4,546,143, Cl. 524-511.000.

Saurwein, Albert C., to McCartney Manufacturing Company. Center feeding water jet/abrasive cutting nozzle assembly. 4,545,157, Cl. 51-439.000.

Savastenko, Galina N.: *See*—
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.

Sawada, Hideo, to Hitachi, Ltd. Division apparatus. 4,546,447, Cl. 364-767.000.

Sawada, Seigo: *See*—
Miyasaka, Tadashi; Sawada, Seigo; Nokata, Kenichiro; and Mutai, Masahiko, 4,545,880, Cl. 204-158.00R.

Sawicki, Nina P. Tamper indicating cover. 4,545,494, Cl. 215-232.000.

Sazanami, Tsuneo: *See*—
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.

Scaramucci, Maria A.: *See*—
Gazzi, Luigi; Rescalli, Carlo; Scaramucci, Maria A.; and Ginnasi, Alessandro, 4,545,965, Cl. 423-229.000.

Scarantino, Michael A.: *See*—
Dunavin, Timothy E.; and Scarantino, Michael A., 4,545,689, Cl. 374-1.000.

Scardovi, Alessandro: *See*—
Brescia, Riccardo; Manini, Enrico; Balbo, Edoardo; and Scardovi, Alessandro, 4,546,361, Cl. 346-140.00R.

Schaberg, Richard R.; and Cole, James E., to Gould Inc. Disposable physiological pressure sensing system. 4,545,389, Cl. 128-748.000.

Schadlich, Fritz: *See*—
Armbruster, Gerhard; Schadlich, Fritz; and Seidel, Eberhard, 4,545,121, Cl. 30-374.000.

Schaefer, Donald D., to Dunham-Bush, Inc. Vertical axis hermetic helical screw rotary compressor with discharge gas oil mist eliminator and dual transfer tube manifold for supplying liquid refrigerant and refrigerant vapor to the compression area. 4,545,742, Cl. 417-366.000.

Schaefer, Gerald O. Air brush organizer. 4,545,534, Cl. 239-286.000.

Schaeffer Scovill Verbindungstechnik GmbH: *See*—
Belter, Lothar; and Stoecker, Alberto, 4,545,096, Cl. 24-585.000.

Schaeren, Walter: *See*—
Ray, Claude; and Schaeren, Walter, 4,545,688, Cl. 368-291.000.

Schafer, Doris; and Schafer, Rolf, to Alcon Laboratories, Inc. Polymer hydrogels adapted for use as soft contact lenses, and method of preparing same. 4,546,123, Cl. 523-106.000.

Schafer, Rolf: *See*—
Schafer, Doris; and Schafer, Rolf, 4,546,123, Cl. 523-106.000.

Schaffer, Derace L. Device for monitoring X-ray radiation and method of using same. 4,546,251, Cl. 250-252.100.

Schantz, Robert E.; McCune, James D.; and Prunty, Pleasant A., to Schantz, Robert E. Gas horseshoe forge. 4,545,361, Cl. 126-226.000.

Schanz, Friedrich; Schucker, Emil; and Perrot, Alexander, to Perrot-Regnerbau GmbH & Co. Adjustable oscillating fan-jet sprinkler. 4,545,532, Cl. 239-242.000.

Schar, Meinrad: *See*—
Libicky, Arnost; and Schar, Meinrad, 4,546,069, Cl. 430-390.000.

Schatteman, Etienne A., to Staar, S. A. Loading and unloading system for recording and/or playback apparatus. 4,546,396, Cl. 360-96.500.

Scheidt, Joachim; and Keller, Gottfried, to Rampf Foreman GmbH. Apparatus for producing moldings from concrete. 4,545,754, Cl. 425-419.000.

Schelhas, Peter: *See*—
Gmelin, Karl; Kubach, Hans; Maisch, Wolfgang; Peters, Klaus-Jurgen; and Schelhas, Peter, 4,545,353, Cl. 123-454.000.

Schenk, Raymond L.: *See*—
McLane, Jack E.; and Schenk, Raymond L., 4,545,422, Cl. 164-429.000.

Schepers, Hubert: *See*—
Ullrich, Manfred; Reutler, Herbert; and Schepers, Hubert, 4,545,954, Cl. 376-220.000.

Scherer, Gunther: *See*—
Killer, Eric; Scherer, Gunther; and Stucki, Samuel, 4,546,010, Cl. 427-96.000.

Schering A.G.: *See*—
Lumma, William C., Jr.; and Wohl, Ronald A., 4,545,995, Cl. 514-523.000.
Manecke, Georg; and Klussmann, Udo, 4,546,078, Cl. 435-52.000.

Schiedel GmbH & Co.: *See*—
Munz, Werner, 4,545,293, Cl. 98-58.000.

Schilder, Hans, to J. M. Voith GmbH. Axial flow machine, particularly a blower, with adjustable rotor blades. 4,545,734, Cl. 416-146.00A.

Schilling, Hans-Dieter; and Holl, Lothar, to Bergwerksverband GmbH. Treatment chamber with fluidized bed. 4,545,959, Cl. 422-142.000.

Schindler, Harvey D.; and Chen, James M., to Lummus Crest, Inc. Coal liquefaction and hydrogenation. 4,545,890, Cl. 208-8.0LE.

Schlumberger Technology Corporation: *See*—
Chan, David S. K., 4,545,242, Cl. 73-152.000.
Minerbo, Gerald N.; and McCann, R. Bruce, 4,546,314, Cl. 324-221.000.
Minerbo, Gerald N.; and Hazen, Gary A., 4,546,315, Cl. 324-221.000.
Wambaugh, John O., 4,545,433, Cl. 166-105.000.

Schluter, Wilhelm, to Gebruder Lodige Maschinenbau-Gesellschaft mbH. Method of, and apparatus for, moistening loose material. 4,546,013, Cl. 427-220.000.

Schmeckenbecher, Arnold F.: *See*—
Amendola, Albert; Schmeckenbecher, Arnold F.; and Sobon, Joseph T., 4,546,065, Cl. 430-313.000.

Schmid, Harry, to Asepta AG Wil/SG. Container with lid for effervescent products. 4,545,498, Cl. 215-260.000.

Schmidbaur, Hubert: *See*—
Helbig, Joachim; and Schmidbaur, Hubert, 4,546,195, Cl. 556-50.000.

Schmidt, Delf: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,546,079, Cl. 435-71.000.

Schmidt, Hans-Dieter: *See*—
Hafner, Gunther; Noreikat, Karl-Ernst; Schmidt, Hans-Dieter; Letsche, Ulrich; and Bauer, Bernhard, 4,546,426, Cl. 364-153.000.

Schmidt, Stephen C.: *See*—
Moore, David S.; and Schmidt, Stephen C., 4,545,679, Cl. 356-301.000.

Schmidt, Thomas, to Bayer Aktiengesellschaft. Process for preparing virtually isomer-free 4-amino-3-ethylthio-6-tert.-butyl-1,2,4,-triazin-5-one. 4,546,178, Cl. 544-182.000.

Schmitt, Hans-Georg; Paulus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. Trihaloallyl thiocyanates, a process for their preparation and their use in microbicidal agents. 4,545,994, Cl. 514-514.000.

Schmitt, Kirk D., to Mobil Oil Corporation. Polymeric pyrrolidinium methanesulfonate viscosifiers for aqueous fluids. 4,545,911, Cl. 252-8.50A.

Schmitt, Kirk D., to Mobil Oil Corporation. Two-tailed surfactants having one aromatic containing tail and their use in chemical waterflooding. 4,545,912, Cl. 252-8.55D.

Schmodde, Hermann, to H. Stoll GmbH & Co. Single or multi-cam system for flat-bed knitting machines. 4,545,219, Cl. 66-70.000.

Schneider, Donna. Works of visual and sculptural art and methods of making them. 4,546,019, Cl. 428-13.000.

Schneider, John C. Liquid-liquid extraction process. 4,545,901, Cl. 210-634.000.

Schneider, Wolfger; and Johns, Richard J., to Johns Hopkins University, The. Portable pH data collector. 4,546,436, Cl. 364-415.000.

Schneller, Robert F. Roofing edge seaming apparatus. 4,545,847, Cl. 156-579.000.

Schnellmann, Klaus, to Stapex AG. Lever-actuated tongs. 4,545,234, Cl. 72-410.000.

Schoen, Jerry W.; and Young, Russel L., to Armco Inc. Local annealing treatment for cube-on-edge grain oriented silicon steel. 4,545,828, Cl. 148-111.000.

Schoessow, Glen J., to PowerSafety International, Inc. Training device for nuclear power plant operators. 4,545,766, Cl. 434-218.000.

Schonemann, Walter: *See*—
Jaggle, Gunther; and Schonemann, Walter, 4,545,354, Cl. 123-470.000.

Schrader, Mark E.: *See*—
Knoll, Glenn F.; and Schrader, Mark E., 4,546,255, Cl. 250-369.000.

Schreiber, Fred G.: *See*—
Gradeff, Peter S.; Charte, Vincent J.; Schreiber, Fred G.; and Davison, John F., 4,545,923, Cl. 252-309.000.

Schreiner, Hermann, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Ignition distributor for an internal combustion engine. 4,545,340, Cl. 123-146.50A.

Schreiter, Peter: *See*—
Rothfuss, Hans; Wieland, Gunter; and Schreiter, Peter, 4,545,568, Cl. 266-280.000.

Schroder, Gunter; and Kiehne, Joachim, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for positioning, connecting and handling components. 4,545,569, Cl. 269-43.000.

Schroder, Theo: *See*—
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,546,079, Cl. 435-71.000.

Schroeppel, Edward A., to Cordis Corporation. Method and apparatus for setting and changing parameters or functions of an implanted device. 4,545,380, Cl. 128-419.00P.

Schroer, Franz-Josef, to A. Monforts GmbH & Co. Pin or clip chain for web tensioning or stretching machines. 4,545,098, Cl. 26-89.000.

Schromm, Kurt: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Traunecker, Werner; and Reichl, Richard, 4,546,102, Cl. 514-259.000.

Schucker, Emil: *See*—
Schanz, Friedrich; Schucker, Emil; and Perrot, Alexander, 4,545,532, Cl. 239-242.000.

Schultz, Mitchell D. Trigger mechanism for double barrel shotgun. 4,545,143, Cl. 42-42.00R.

Schurle, Hermann: *See*—
Grimm, Wolfgang; and Schurle, Hermann, 4,545,678, Cl. 356-124.000.

Schuster, Philip C. Shooters table. 4,545,144, Cl. 42-94.000.

Schutten, Herman P.; Lade, Robert W.; and Benjamin, James A., to Eaton Corporation. Lateral bidirectional notch FET with extended gate insulator. 4,546,367, Cl. 357-23.400.

Schwaighofer, Roman: *See*—
Bloch, Peter; Donner, Meinrad; and Schwaighofer, Roman, 4,545,151, Cl. 51-52.00R.

Schwarz, Alois; and Mautz, Karlheinz, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for adjusting the tracking of the blades in a rotor, especially for a rotary wing aircraft. 4,545,733, Cl. 416-138.000.

Schwarz, Gerhard, to Braun Aktiengesellschaft. Electronic device with choke inverter. 4,546,304, Cl. 323-287.000.

Schwarzhoff, Wolfgang: *See*—
Maier, Gernot; Tischler, Heinrich; Wohr, Rolf; and Schwarzhoff, Wolfgang, 4,545,632, Cl. 339-18.00R.

Schweikl, Ludwig; and Krauss, Olaf, to MTU Motoren-Und-Turbinen Union Munchen GmbH. Vented liquid reservoir. 4,545,791, Cl. 55-182.000.

Scifres, Donald R.: *See*—
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,546,480, Cl. 372-45.000.

SCM Corporation: *See*—
Baucom, Keith B., 4,546,184, Cl. 544-353.000.

Scripps Clinic and Research Foundation: *See*—
Houghten, Richard A., 4,545,931, Cl. 260-112.50R.

SDS Biotech Corporation: *See*—
Pyne, William J.; Lowbridge, John; Chang, In-Kook; Knotz, Florian; and Powers, Larry J., 4,545,810, Cl. 71-92.000.

SDS Biotech K.K.: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,545,809, Cl. 71-92.000.

Sealtran Corp.: *See*—
Minkus, Morton; and Drower, Herbert M., 4,545,838, Cl. 156-220.000.

Seaquist Valve Company: *See*—
Kinsley, John P., 4,545,495, Cl. 215-235.000.

Searson, Thomas E. Bathing spray apparatus. 4,545,083, Cl. 4-615.000.

Seaver, Randall J.: *See*—
Sankey, Edward M.; and Seaver, Randall J., 4,545,199, Cl. 60-226.200.

Seay, James R.: *See*—
Benton, Thomas K.; and Seay, James R., 4,545,260, Cl. 73-861.650.

Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The: *See*—
Harvey, Michael J.; and Atkinson, Anthony, 4,546,161, Cl. 527-312.000.

Seefeldt, Joachim, to Bielomatik Leuze GmbH & Co. Process and apparatus for transporting piles of sheets. 4,545,715, Cl. 414-36.000.

Seeq Technology, Inc.: *See*—
Gupta, Anil; and Perlegos, George, 4,546,454, Cl. 365-200.000.

Seidel, Eberhard: *See*—
Armbruster, Gerhard; Schadlich, Fritz; and Seidel, Eberhard, 4,545,121, Cl. 30-374.000.

Seigneurin, Laurent: *See*—
Bergez, Pierre; Deguelte, Alain; and Seigneurin, Laurent, 4,545,964, Cl. 423-138.000.

Seiki, Kazuo: *See*—
Tanaka, Akira; Seiki, Kazuo; and Nakamura, Haruyoshi, 4,545,193, Cl. 57-261.000.

Seiler, Herbert, to Ciba-Geigy Corporation. Reactive dyes, process for their preparation and the use thereof. 4,545,785, Cl. 8-549.000.

Seki, Masaki: *See*—
Kishi, Hajimu; and Seki, Masaki, 4,546,427, Cl. 364-168.000.

Seki, Nagataka, to Tokyo Shibaura Denki Kabushiki Kaisha. Multiple inverters with overcurrent and shoot-through protection. 4,546,423, Cl. 363-56.000.

Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, to SDS Biotech K.K. Herbicidal N-(5-t-butyl-3-pyrazolyl) carbamates. 4,545,809, Cl. 71-92.000.

Sekiguchi, Shizuo; Kitano, Kyozo; and Nagano, Katsumasa, to Lion Corporation. Process for producing sulfonate of unsaturated fatty acid ester. 4,545,939, Cl. 260-400.000.

Sekiya, Shinji: and Ono, Takatoshi, to Disco Co., Ltd. Grinding wheel for flat plates. 4,545,154, Cl. 51-209.00R.

Seko, Kiyoshi, to Fuji Machinery Co., Ltd. Timing adjusting device for packaging machines. 4,545,174, Cl. 53-51.000.

Selenia Industrie Eletroniche Associate, S.p.A.: *See*—
Bagaglia, Adriano; Marchetti, Renato; and Penco, Eugenio, 4,546,482, Cl. 372-86.000.

Sellars, Graham P., to Burroughs Corporation. Differential signal decoders. 4,546,395, Cl. 360-77.000.

Sellett, Andrew J.; and Langham, J. Michael. Apparatus for determining the true cross slope of a blade. 4,545,439, Cl. 172-430.000.

Selvarajan, Radhakrishnan: *See*—
Connelly, Lawrence J.; and Selvarajan, Radhakrishnan, 4,545,902, Cl. 210-734.000.

Sensabaugh, Andrew J., Jr.; Crepps, Dewitt C.; Rice, William Y., Jr.; and Fearrington, George W., Jr., to R. J. Reynolds Tobacco Co. Tobacco product. 4,545,392, Cl. 131-352.000.

Seragnoli, Enzo; and Gamberini, Antonio, to G. D. Societa per Azioni. Device monitoring the quality of cigarettes in a packaging machine. 4,545,488, Cl. 209-535.000.

Sernagiotto, Emilio: *See*—
Visconti, Alfonso; Sernagiotto, Emilio; and Sernagiotto, Raffaello M., 4,545,903, Cl. 210-96.100.

Sernagiotto, Raffaello M.: *See*—
Visconti, Alfonso; Sernagiotto, Emilio; and Sernagiotto, Raffaello M., 4,545,903, Cl. 210-96.100.

Service Ideas, Inc.: *See*—
Collins, Harry F., 4,546,237, Cl. 219-531.000.

Shaffer, Jesse S.: *See*—
Kent, Thomas A.; and Shaffer, Jesse S., 4,546,415, Cl. 361-433.000.

Shaikh, Maqboolhusein G., to A. O. Smith Corporation. Electric power supply connection for submersible capacitor-start motor apparatus. 4,546,300, Cl. 318-786.000.

Shalaby, Shalaby W.: *See*—
Koelmel, Donald F.; Jamiolkowski, Dennis D.; Shalaby, Shalaby W.; and Bezwada, Rao S., 4,546,152, Cl. 525-437.000.

Shanni International, Inc.: *See*—
Colvin, Harry, 4,545,171, Cl. 52-79.500.

Shapland, Earl P.; and King, Patrick D., to USS Engineers & Consultants, Inc. Full throttle valve and method of tube and gate change. 4,545,512, Cl. 222-600.000.

Sharp, David L., to Simmonds Precision Products, Inc. Liquid level sensor using sonic methods. 4,545,245, Cl. 73-290.00V.

Sharp, John, to Coal Industry (Patents) Limited. Mining installation equipment. 4,545,621, Cl. 299-12.000.

Sharp Kabushiki Kaisha: *See*—
Iwagami, Fusao, 4,546,363, Cl. 346-140.00R.
Sasaki, Takehiko; and Koyama, Tamotsu, 4,545,647, Cl. 350-331.00R.
Yamamoto, Saburo; Hayashi, Hiroshi; and Yano, Seiki, 4,546,481, Cl. 372-48.000.

Sharpless, Charles H.; and Van Slooten, Robert W., to AT&T Bell Laboratories. Parity checking arrangement. 4,546,475, Cl. 371-49.000.

Shatterproof Glass Corporation: *See*—
McKelvey, Harold E., 4,545,882, Cl. 204-192.00R.

Shaw, Herbert J.; and Chodorow, Marvin, to Leland Stanford Junior University, The Board of Trustees of The. Fiber optic amplifier. 4,546,476, Cl. 372-6.000.

Shaw, Lendon J. Weathershield and safety screen for opening windows in buildings. 4,545,148, Cl. 49-50.000.

Shearer, Clyde H.: *See*—
Reynolds, George H.; Elsner, Norbert B.; and Shearer, Clyde H., 4,545,967, Cl. 423-263.000.

Shell Offshore Inc.: *See*—
Denison, Early B., 4,545,437, Cl. 166-345.000.

Shell Oil Company: *See*—
Langner, Carl G., 4,545,139, Cl. 37-197.000.
Stoutamire, Donald W., 4,546,198, Cl. 560-105.000.

Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., to Goodyear Tire & Rubber Company, The. Method of making and using ternary alloy coated steel wire. 4,545,834, Cl. 156-124.000.

Shen, Ming; and McAfee, Richard C., to SWS Silicones Corporation. Process for preparing a one-component organopolysiloxane composition. 4,546,164, Cl. 528-15.000.

Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., to Merck & Co., Inc. Anti-inflammatory 2-methyl-3-hydroxy-4-alkenoylthiomethyl-5-vinyl-pyridine derivatives. 4,546,106, Cl. 514-345.000.
Sheppard, Christine M.; Puxley, David C.; Banks, Reginald G. S.; and McKenzie, Donald, to British Gas Corporation. Catalysts. 4,546,091, Cl. 502-84.000.
Sherritt Gordon Mines Limited: *See—*
Weir, Donald R.; Masters, Ian M.; Doyle, Barry N.; and Chalkley, Michael E., 4,545,963, Cl. 423-26.000.
Sherritt, William C.: *See—*
Giles, George B.; Ross, Donald B.; McCallion, Joseph J.; and Sherritt, William C., 4,545,759, Cl. 431-344.000.
Shiba, Haruo; and Takeda, Shigetomo, to TDK Corporation. Casing for a magnetic tape cassette. 4,545,483, Cl. 206-387.000.
Shibahata, Yasuji, to Nissan Motor Co., Ltd. Independent rear suspension system for automotive vehicle. 4,545,602, Cl. 280-701.000.
Shigemoto, Hiromi, to Mitsui Petrochemical Industries, Ltd. Film of polymer mixture containing 4-methyl-1-petene polymer. 4,546,150, Cl. 525-240.000.
Shih, Yen-Jer, to National Starch and Chemical Corporation. One-package aqueous latices containing alkaline-curable self-crosslinking polymers. 4,546,140, Cl. 524-394.000.
Shimada, Kiyotaka: *See—*
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.
Shimadzu Corporation: *See—*
Yamauchi, Hiroshi, 4,546,254, Cl. 250-305.000.
Shimano, Akira: *See—*
Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira, 4,545,551, Cl. 242-35.50A.
Shimazaki, Takeshi: *See—*
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,546,168, Cl. 528-107.000.
Shimizu, Hirokazu; Itoh, Kunio; Sugino, Takashi; and Wada, Masaru, to Matsushita Electric Industrial Co., Ltd. Semiconductor laser. 4,546,478, Cl. 372-36.000.
Shimizu, Kousaku: *See—*
Tomioka, Shunzoo; Nakano, Masaaki; Okano, Kinpei; Shimizu, Kousaku; and Yoda, Hiroaki, 4,545,741, Cl. 417-365.000.
Shimizu, Seiki: *See—*
Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, 4,546,222, Cl. 200-144.00B.
Shimizu, Shigemi: *See—*
Sugimoto, Kazuo; Shimizu, Shigemi; and Terauchi, Kiyoshi, 4,545,746, Cl. 418-55.000.
Shimizu, Tsutomu: *See—*
Miyata, Jun; Yagii, Koji; and Shimizu, Tsutomu, 4,545,825, Cl. 148-3.000.
Shimoda, Ikuo: *See—*
Izeki, Jiro; and Shimoda, Ikuo, 4,545,466, Cl. 188-268.000.
Shin Nikkei Company, Ltd.: *See—*
Inokawa, Michio; Watanabe, Minoru; Miyasaka, Yoshiteru; and Watanabe, Toshio, 4,545,292, Cl. 98-42.210.
Shinada, Kazuyoshi: *See—*
Yogome, Yoshihiro; Kobashi, Yuuji; and Shinada, Kazuyoshi, 4,545,469, Cl. 192-51.000.
Shinkai, Kenkichi: *See—*
Nagano, Mitsuo; Hirai, Koichi; Kitamura, Kouichi; Shinkai, Kenkichi; and Yasuda, Hiroshi, 4,545,942, Cl. 260-465.00D.
Shinko Electric Industries Co., Inc.: *See—*
Hori, Kuniyuki; and Kitazawa, Kiyoshi, 4,545,885, Cl. 204-207.000.
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Method for producing electro-thermal transducer. 4,545,881, Cl. 204-192.0SP.
Shinohara, Masanao: *See—*
Nakayama, Yasuo; Miyazaki, Wasei; and Shinohara, Masanao, 4,545,988, Cl. 424-94.000.
Shioi, Keiko; and Shoji, Yukito, to Sakupa Color Products Corp. Writing implement containing dual color ink composition. 4,545,819, Cl. 106-23.000.
Shiokawa, Kozo: *See—*
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,545,944, Cl. 260-545.00R.
Shirai, Akira: *See—*
Ohba, Hisao; Shirai, Akira; Kitazumi, Etsuo; and Kato, Norihiko, 4,545,866, Cl. 204-33.000.
Shirato, Yoshiaki: *See—*
Shinmi, Akira; Fukui, Masahisa; Hara, Toshitami; Shirato, Yoshiaki; and Hajimoto, Yoshioki, 4,545,881, Cl. 204-192.0SP.
Shirey, Richard, to Donn Incorporated. Expanded metal products. 4,545,170, Cl. 52-670.000.
Shivers, Horace L. Container and closure with tamper indicating means. 4,545,493, Cl. 215-230.000.
Shoji, Yukito: *See—*
Shioi, Keiko; and Shoji, Yukito, 4,545,819, Cl. 106-23.000.
Shone, Robert L.: *See—*
Miyano, Masatoru; Villamil, Clara I.; and Shone, Robert L., 4,546,194, Cl. 549-401.000.
Showdown Electronics, Inc.: *See—*
Pearman, Bruce W.; Pelton, Clark; Roper, Todd K.; and Tivis, Layne C., 4,545,583, Cl. 273-311.000.
Shuler, Bernard R., to Allis-Chalmers Corporation. Air filter system with supporting and sealing grid. 4,545,793, Cl. 55-355.000.
Shulman, Joseph; and Clifford, David L., to Polaroid Corporation. Nacreous transflector illumination system for liquid crystal display. 4,545,648, Cl. 350-337.000.
Shumpert, Thomas H.: *See—*
Edlin, George R.; Shumpert, Thomas H.; and Strickland, Brian R., 4,546,358, Cl. 343-703.000.
Shumway, Warren R. Combination gear ratchet wrench apparatus. 4,545,267, Cl. 81-57.290.
Shuskus, Alexander J., to United Technologies Corporation. Phosphorous-nitrogen based glasses for the passivation of III-V semiconductor materials. 4,546,372, Cl. 357-52.000.
Siderko, Valentina M.: *See—*
Ermolenko, Igor N.; Koshevar, Vasily D.; Nedzvetsky, Viktor S.; Savastenko, Galina N.; Siderko, Valentina M.; Kaputsky, Fedor N.; Komar, Valentina V.; and Nadievskaya, Juzefa I., 4,546,063, Cl. 430-269.000.
Sieben, Joannes H. F. C.: *See—*
Wolf, Joost M.; Post, Hendrik A.; Stigter, Willem H.; van der Brug, Gerard J.; and Sieben, Joannes H. F. C., 4,545,550, Cl. 242-200.000.
Siemens AG: *See—*
Hetz, Walter; and Weber, Peter, 4,545,386, Cl. 128-660.000.
Siemens Aktiengesellschaft: *See—*
Auracher, Franz; and Keil, Rudolf, 4,545,642, Cl. 350-96.190.
Barre, Claude, 4,546,271, Cl. 307-443.000.
Ciszewski, Hans-Joachim; Pabst, Josef; and Weisser, Hans-Joerg, 4,545,956, Cl. 422-28.000.
Kuhnke, Hermann; and Rattner, Manfred, 4,546,489, Cl. 378-103.000.
Lubke, Wilfried, 4,545,730, Cl. 417-68.000.
Pirschel, Joerg, 4,545,385, Cl. 128-660.000.
Vanhumbeeck, Jacky; Danneels, Laurent; De Steur, Hubert; and Heyneman, Guido, 4,545,957, Cl. 422-81.000.
Sienkowski, Kenneth J.: *See—*
Bay, Paul G.; Boyer, Nicodemus E.; and Sienkowski, Kenneth J., 4,546,139, Cl. 524-367.000.
Sieswerda, Bauke: *See—*
Renardus, Max L. P.; and Sieswerda, Bauke, 4,546,284, Cl. 313-25.000.
SIG Schweizerische Industrie-Gesellschaft: *See—*
Rebsamen, August; and Low, Martin, 4,545,179, Cl. 53-443.000.
Sikdar, Subhas K.: *See—*
Mendiratta, Ashok K.; and Sikdar, Subhas K., 4,546,207, Cl. 568-723.000.
Silvers, Kenneth W.: *See—*
McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, 4,546,382, Cl. 358-84.000.
Simcoe, Kent W.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.
Simmonds Precision Products, Inc.: *See—*
Sharp, David L., 4,545,245, Cl. 73-290.00V.
Simo, Jan: *See—*
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.
Simon-Hartley Limited: *See—*
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,545,909, Cl. 210-618.000.
Simpson, Robert A.; Trotter, Ralph R.; and Weber, Edward V., to International Business Machines Corporation. Alignment technique. 4,546,260, Cl. 250-491.100.
Simpson, Scott S.; Yeznach, Anthony; and Barton, Carlos L., to Rogers Corporation. Epoxy foam. 4,546,118, Cl. 521-130.000.
Sims, Larry A.: *See—*
Grossmann, Frederic; and Sims, Larry A., 4,545,371, Cl. 128-132.00D.
Singer Company, The: *See—*
Giaimo, Anthony; Larsen, Robert H.; and Rodda, Donald, 4,545,311, Cl. 112-254.000.
Greenwood, Ivan, 4,545,682, Cl. 356-350.000.
Jarvis, Kevin M., 4,545,765, Cl. 434-43.000.
Kuchuris, George F., 4,546,340, Cl. 336-192.000.
Laughon, Thomas C.; Haynes, H. Taylor; Klopach, Robert T.; and Warner, Richard C., 4,546,357, Cl. 343-702.000.
Singer, Hans S., to Hans S. Singer Co., Inc. Creel component and creel consisting of several components. 4,545,547, Cl. 242-131.000.
Sitterding, Richard K.: *See—*
Daniel, Winfield C.; and Sitterding, Richard K., 4,545,221, Cl. 68-181.00R.
Sittig, Wolfgang: *See—*
Prave, Paul; and Sittig, Wolfgang, 4,545,945, Cl. 261-36.00R.
Sitzmann, Michael E.; and Adolph, Horst G., to United States of America, Navy. 2,2-Dinitrobutane-1,4-diol and monoesters. 4,546,200, Cl. 560-222.000.
SKF Industrial Trading & Development Company B.V.: *See—*
Bras, Johan C. M.; and Gabelli, Antonio, 4,545,692, Cl. 384-477.000.
Skiff, Ronald H.: *See—*
Katz, Saul N.; and Skiff, Ronald H., 4,545,998, Cl. 426-424.000.
SKIL Corporation: *See—*
Hartmann, James R., 4,545,123, Cl. 30-393.000.

Skipor, Eugene: *See—*
Niemiro, Josef W.; and Skipor, Eugene, 4,545,782, Cl. 493-425.000.
Skipper, John D.: *See—*
Higgins, Charles H.; and Skipper, John D., 4,546,343, Cl. 340-347.0AD.
Skripek, Milan R.: *See—*
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., 4,545,859, Cl. 201-17.000.
Smith, Dwight, to Elkins, Marvin, a part interest. Stencilling device. 4,545,481, Cl. 206-219.000.
Smith, Edwin B.; and Fogleboch, John R., Sr., to United States of America, Air Force. PLL Swept frequency generator with programmable sweep rate. 4,546,328, Cl. 331-4.000.
Smith International, Inc.: *See—*
Alder, Robert L., 4,545,241, Cl. 73-151.000.
Smith, James A.; and Kellett, George W., Jr., to Creative Products Resource Associates Ltd. Automatic dishwasher product in solid form. 4,545,917, Cl. 252-90.000.
Smith, Leonard S., to Century Mfg. Co. Protective sensing means for battery charging circuit. 4,546,302, Cl. 320-25.000.
Smith, Loren C.: *See—*
Gruber, Arthur W.; and Smith, Loren C., 4,545,400, Cl. 137-467.000.
Smith, Richard D.; and Van Grouw, Samuel J. Clean burning solid fuel stove and method. 4,545,360, Cl. 126-76.000.
Smith, Ronald T.: *See—*
Chern, Mao-Jin; Smith, Ronald T.; and Peters, John W., 4,545,646, Cl. 350-162.200.
Smith, Stanley B., Jr., to Allied Corporation. Spectroanalysis system. 4,545,680, Cl. 356-319.000.
Smith, Terence J.: *See—*
Irving, Edward; and Smith, Terence J., 4,546,067, Cl. 430-325.000.
Smith, Thomas E.: *See—*
Gusack, James A.; and Smith, Thomas E., 4,545,835, Cl. 156-180.000.
Smithgall, David H., Sr.: *See—*
Frazee, Ralph E., Jr.; Myers, Daryl L.; and Smithgall, David H., Sr., 4,545,542, Cl. 242-18.00A.
Smolka, Heinz-Gerd: *See—*
Diekotter, Friedrich W.; Honges, Edgar; Just, Gunther; Smolka, Heinz-Gerd; and Wust, Willi, 4,545,969, Cl. 423-328.000.
Smythe, Stephen R.: *See—*
Whitmore, Martyn W.; Pollard, Michael D.; and Smythe, Stephen R., 4,546,174, Cl. 534-838.000.
Snamprogetti, S.p.A.: *See—*
Gazzi, Luigi; Rescalli, Carlo; Scaramucci, Maria A.; and Ginnasi, Alessandro, 4,545,965, Cl. 423-229.000.
Snow, Harold D.: *See—*
Rand, Robert W.; Snow, Harold D.; Elliott, David G.; and Haskins, Glenn M., 4,545,368, Cl. 128-1.300.
Snyder, Robert G.: *See—*
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., 4,545,411, Cl. 141-91.000.
Sobey, Arthur E., Jr., to LTV Aerospace and Defense. High speed erasing and rebiasing of thermoptic thin films in the medium and long-wave infrared. 4,545,641, Cl. 350-1.100.
Sobon, Joseph T.: *See—*
Amendola, Albert; Schmeckenbecher, Arnold F.; and Sobon, Joseph T., 4,546,065, Cl. 430-313.000.
Soboul, Raymond: *See—*
Lehmann, Jean-Marc; Soboul, Raymond; and Macaire, Marcel, 4,546,221, Cl. 200-50.0AA.
Societe de Fabrication d'Instruments de Mesure: *See—*
Audren, Jean-Thierry; and Pelletier, Charlie, 4,546,292, Cl. 318-116.000.
Societe Nationale des Poudres et Explosifs: *See—*
Delarche, Hubert; Brasquies, Alain; and Maures, Michel, 4,546,175, Cl. 536-35.000.
Soda, Kenji: *See—*
Ohshima, Toshihisa; and Soda, Kenji, 4,546,077, Cl. 435-26.000.
Solex (U.K.) Limited: *See—*
Pagdin, Brian C.; and Marriage, David J., 4,545,345, Cl. 123-299.000.
Soma Traders Ltd.: *See—*
Law, Nin Y., 4,545,776, Cl. 446-443.000.
Sonneborn, Lamburtus J., to Applied Power, Inc. Seal for a rotary hydraulic valve. 4,545,408, Cl. 137-625.460.
Sonoda, Nobuo: *See—*
Nishida, Mitsuhiro; Yamamoto, Sakuei; Sonoda, Nobuo; Okahashi, Kazuo; and Takagi, Shoji, 4,546,130, Cl. 523-459.000.
Sony Corporation: *See—*
Asami, Shojiro; and Sumihiro, Hiroshi, 4,546,397, Cl. 360-99.000.
Morioka, Yoshihiro; and Sugimoto, Hiroyuki, 4,546,291, Cl. 315-382.000.
Sako, Yoichiro; and Odaka, Kentaro, 4,546,474, Cl. 371-39.000.
Yamaguchi, Tokundo; Kimizuka, Masanori; and Kawashima, Isao, 4,545,500, Cl. 220-4.00B.
Souchi, Toshiyuki: *See—*
Kato, Taizo; and Souchi, Toshiyuki, 4,545,548, Cl. 242-156.000.
Sovonics Solar Systems: *See—*
Izu, Masatsugu; and Gattuso, David A., 4,545,136, Cl. 34-155.000.
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., to Hewlett-Packard Company. Programmable calculator including program variable initialization means and definition means array. 4,546,448, Cl. 364-900.000.
Spanjer, Keith G.: *See—*
Olsen, Dennis R.; and Spanjer, Keith G., 4,546,374, Cl. 357-71.000.
Speed Cut, Inc.: *See—*
Germond, Henry S., 4,545,274, Cl. 83-486.100.
Spencer Wright Industries, Inc.: *See—*
Ingram, Gary L., 4,545,312, Cl. 112-256.000.
Speranzin, Claudio: *See—*
Bertoli, Luciano; Badiali, Roberto; and Speranzin, Claudio, 4,545,191, Cl. 57-22.000.
Sperry Corporation: *See—*
Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., 4,546,430, Cl. 364-200.000.
Prohofsky, LeRoy A.; and Hanson, David G., 4,546,349, Cl. 340-731.000.
Spiegler, Wolfgang: *See—*
Jahn, Dieter; Becker, Rainer; Keil, Michael; Spiegler, Wolfgang; and Wuerzer, Bruno, 4,545,806, Cl. 71-88.000.
Spinelli, Thomas S.; Manns, William G.; and Weirauch, Donald F., to Texas Instruments Incorporated. Electronic circuit interconnection system. 4,546,406, Cl. 361-386.000.
Spiral Binding Company, Inc.: *See—*
Henes, Martin E.; and Roth, George, 4,545,603, Cl. 281-21.00A.
Spitaler, Engelbert; Oberleitner, Gerhard; Svoboda, Josef; Nitschko, Theodor; and Riss, Wilfried, to TMC Corporation. Safety ski binding. 4,545,598, Cl. 280-612.000.
Spooner, Robert J.; and Dillon, Oscar W., to Cashin Systems Corp. Apparatus for stacking and weighing sliced food products. 4,545,447, Cl. 177-165.000.
Sprecker, Mark A.: *See—*
Wiegers, Wilhelmus J.; and Sprecker, Mark A., 4,546,208, Cl. 568-814.000.
Sr-Kone Oy: *See—*
Sarja, Asko, 4,545,946, Cl. 264-70.000.
Srubar, Jiri : *See—*
Hau, Antonin; Srubar, Jiri ; Esenovskij-Laskov, Jurij K.; and Giruckij, Olgert I., 4,545,264, Cl. 74-688.000.
Staar, S. A.: *See—*
Schatteman, Etienne A., 4,546,396, Cl. 360-96.500.
Stach, Leonard J.: *See—*
Luteri, George F.; Stach, Leonard J.; and Nickell, Louis G., 4,546,196, Cl. 560-65.000.
Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., 4,545,813, Cl. 71-107.000.
Stadtfeld, Gerhard: *See—*
Christmann, Burkhard; Weber, Jorg; and Stadtfeld, Gerhard, 4,545,420, Cl. 164-150.000.
Stafford, Donald W.: *See—*
Bartlett, John C.; Bohnhoff, Alan E.; Croley, Donald F.; Dyer, Stanley; Edds, Kenneth E.; Horlander, Frank J.; and Stafford, Donald W., 4,545,693, Cl. 400-120.000.
Stagg, George A., Jr., to Pentad Corp. Device for randomly selecting numbers. 4,545,578, Cl. 273-144.00B.
Stahel, Paul: *See—*
Carbonneau, James T.; and Stahel, Paul, 4,546,277, Cl. 310-13.000.
Stamicarbon B.V., Licensing Subsidiary of DSM: *See—*
Loontjens, Jacobus A.; and Muskens, Bernardus J., 4,546,092, Cl. 502-105.000.
Stamp, Thomas B. Partition wall battery box puncher. 4,545,273, Cl. 83-184.000.
Standard Oil Co., The: *See—*
Rappas, Alkis S., 4,545,816, Cl. 75-101.00R.
Standard Telephones and Cables, Public Limited Company: *See—*
Adams, Graham L.; Briscoe, Peter F.; and Dyson, Arthur F., 4,545,108, Cl. 29-570.000.
Stanton, George E., to Nujack Oil Pump Corporation. Method for pumping a liquid from a well and apparatus for use therein. 4,545,737, Cl. 417-53.000.
Stapex AG: *See—*
Schnellmann, Klaus, 4,545,234, Cl. 72-410.000.
Starinshak, Thomas W.: *See—*
Shemenski, Robert M.; Kim, Dong K.; and Starinshak, Thomas W., 4,545,834, Cl. 156-124.000.
Starkenberg, John J.; and Gibbons, Gould, Jr., to United States of America, Army. Emulsion synthesized composite high explosives. 4,545,829, Cl. 149-109.600.
Starmer, John E., to Metro Products (Accessories & Leisure) Limited. Tire pressure indicating device. 4,545,246, Cl. 116-315.000.
Stauffer Chemical Company: *See—*
Bufalini, Angelo J.; and Gaughan, Edmund J., 4,545,805, Cl. 71-87.000.
Hyzak, Daniel L.; Pallos, Ferenc M.; and Hsu, Joanna K., 4,546,199, Cl. 560-165.000.
Lato, Stephen M., 4,545,789, Cl. 55-71.000.
Ste. Gaz de France: *See—*
Bras, Jean, 4,545,205, Cl. 60-525.000.
Stearns Manufacturing Company: *See—*
Evert, Karla R., 4,545,773, Cl. 441-114.000.
Steffensen, Bjarne T. Cutting mill for the comminution of synthetic material bodies such as runners, injection moulding parts, blown moulding parts and the like. 4,545,539, Cl. 241-73.000.
Stenberg, Roger A.: *See—*
Stohlquist, Roger H.; and Stenberg, Roger A., 4,545,183, Cl. 53-566.000.

Stepanenko, Alexandr V.; Voitov, Vladimir G.; Klimenkov, Stepan S.; Bartashevich, Svyatoslav A.; and Karpitsky, Viktor S., to Belorussky Politekhnichesky Institut. Method for manufacturing microwire and device for effecting same. 4,545,229, Cl. 72-73.000.

Stevens, David R.: *See—*
Giles, Richard E.; Stevens, David R.; and Wiesehahn, Gary P., 4,545,987, Cl. 424-89.000.

Stewart, William S.; and Blaesi, John E., to Phillips Petroleum Company. Control of an aromatic extraction. 4,545,894, Cl. 208-311.000.

Stigter, Willem H.: *See—*
Wolf, Joost M.; Post, Hendrik A.; Stigter, Willem H.; van der Brug, Gerard J.; and Sieben, Joannes H. F. C., 4,545,550, Cl. 242-200.000.

Stockburger, Hermann; and Bauer, Siegfried. Method for protecting against the re-transfer of uniquely recorded information on a data carrier and apparatus for recording and/or reading re-transfer-protected information. 4,546,242, Cl. 235-454.000.

Stockhausen, Philip J. Sailboard cargo carrier. 4,545,772, Cl. 441-74.000.

Stockton, William W., to United States of America, Air Force. Asymmetric thrust warning system for dual engine aircraft. 4,546,353, Cl. 340-966.000.

Stodolka, Mark J., to Occidental Chemical Corporation. Process for cleaning vessels containing sulfur dichloride. 4,545,822, Cl. 134-10.000.

Stoecker, Alberto: *See—*
Belter, Lothar; and Stoecker, Alberto, 4,545,096, Cl. 24-585.000.

Stohlquist, Roger H.; and Stenberg, Roger A., to APV Anderson Bros. Inc. Packaging machine. 4,545,183, Cl. 53-566.000.

Stolle Research & Development Corporation: *See—*
Meyers, William E.; and Beck, Lee R., 4,546,083, Cl. 435-240.000.

Stoller, Herbert I.: *See—*
Feinberg, Irving; Kraus, Charles J.; and Stoller, Herbert I., 4,546,413, Cl. 361-410.000.

Stone, Theodore M. Multiposition level. 4,545,129, Cl. 33-390.000.

Storm, Joe. Wind turbine apparatus. 4,545,729, Cl. 416-132.00B.

Stoutamire, Donald W., to Shell Oil Company. Asymmetric synthesis of esters and acids. 4,546,198, Cl. 560-105.000.

Streifer, William: *See—*
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,546,480, Cl. 372-45.000.

Strickland, Brian R.: *See—*
Edlin, George R.; Shumpert, Thomas H.; and Strickland, Brian R., 4,546,358, Cl. 343-703.000.

Strickler, Rainer: *See—*
Baur, Richard; Oppenlander, Knut; Strickler, Rainer; and Barthold, Klaus, 4,546,151, Cl. 525-430.000.

Strnad, Frank F. Sound attachment for a reed instrument. 4,545,277, Cl. 84-1.040.

Stryzak, Bohdan: *See—*
McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, 4,546,382, Cl. 358-84.000.

Stubb, Paul R. Method for electrodeposition of materials. 4,545,865, Cl. 204-23.000.

Stuckey, William C. Compact torque converter tool. 4,545,268, Cl. 81-57.310.

Stucki, Samuel: *See—*
Killer, Eric; Scherer, Gunther; and Stucki, Samuel, 4,546,010, Cl. 427-96.000.

Stuermer, Burkhard: *See—*
Deininger, Horst; and Stuermer, Burkhard, 4,545,203, Cl. 60-468.000.

Suchy, Milos: *See—*
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,545,807, Cl. 71-92.000.

Suda, Teruo: *See—*
Akiba, Yutaka; Futami, Toshio; and Suda, Teruo, 4,546,210, Cl. 174-114.00R.

Sudoh, Chuzoh; Hagita, Hyoji; Asakawa, Motoo; Nagai, Hiroshi; and Aihara, Kenji, to Sumitomo Metal Industries, Ltd. Apparatus for dry type continuous wire drawing. 4,545,227, Cl. 72-12.000.

Suehisa, Shiro; and Kajiwara, Hideki, to Joto Chemical Company, Ltd. Mixing device. 4,545,685, Cl. 366-144.000.

Suematsu, Toshio: *See—*
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, 4,545,349, Cl. 123-339.000.

Sueyasu, Masanobu: *See—*
Tanoue, Toyosuke; Sueyasu, Masanobu; Fukuda, Mitsuichiro; and Matsuo, Tohru, 4,545,786, Cl. 48-92.000.

Sugi, Hikaru: *See—*
Fujiwara, Kenichi; Sugi, Hikaru; and Hasada, Eiichi, 4,545,213, Cl. 6 R-158.000.

Sugii, Toshihiro: *See—*
Ito, Takashi; Sugii, Toshihiro; Fukano, Tetsu; and Horie, Hiroshi, 4,545,114, Cl. 29-579.000.

Sugimori, Hideo. Non-continuous sensing apparatus for a temperature control. 4,546,239, Cl. 219-497.000.

Sugimoto, Hiroyuki: *See—*
Morioka, Yoshihiro; and Sugimoto, Hiroyuki, 4,546,291, Cl. 315-382.000.

Sugimoto, Kazuo; Shimizu, Shigemi; and Terauchi, Kiyoshi, to Sanden Corporation. Rotation-preventing device for an orbiting piston-type fluid displacement. 4,545,746, Cl. 418-55.000.

Sugimoto, Takao: *See—*
Kinoshita, Masao; Yamanaka, Teruo; Hayakawa, Kizo; and Sugimoto, Takao, 4,545,238, Cl. 73-117.300.

Sugino, Takashi: *See—*
Shimizu, Hirokazu; Itoh, Kunio; Sugino, Takashi; and Wada, Masaru, 4,546,478, Cl. 372-36.000.

Sugita, Yutaka: *See—*
Suzuki, Ryo; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,546,452, Cl. 365-36.000.

Sul, Yun T. Lift for vehicle maintenance. 4,545,462, Cl. 187-8.410.

Sulzer Brothers Limited: *See—*
Grether, Paul; Brader, Kurt; and Keller, Bruno, 4,545,160, Cl. 52-172.000.

Sulzer-Escher Wyss Ltd.: *See—*
Holliger, Karl, 4,545,726, Cl. 415-26.000.

Sumihiro, Hiroshi: *See—*
Asami, Shojiro; and Sumihiro, Hiroshi, 4,546,397, Cl. 360-99.000.

Sumitomo Chemical Company, Limited: *See—*
Ishizumi, Kikuo; Muramatsu, Michihisa; Sato, Hiromi; Tanno, Norihiko; and Yoshida, Noboru, 4,545,936, Cl. 260-377.000.
Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,545,812, Cl. 71-103.000.

Sumitomo Electric Industries, Ltd.: *See—*
Miyajiri, Tetsuo; Habasaki, Toshimi; Yokota, Hiroshi; Tsurita, Tamio; and Nakahara, Motohiro, 4,545,801, Cl. 65-157.000.
Sunago, Katsuyoshi, 4,545,657, Cl. 350-600.000.

Sumitomo Metal Industries, Ltd.: *See—*
Sudoh, Chuzoh; Hagita, Hyoji; Asakawa, Motoo; Nagai, Hiroshi; and Aihara, Kenji, 4,545,227, Cl. 72-12.000.
Tanoue, Toyosuke; Sueyasu, Masanobu; Fukuda, Mitsuichiro; and Matsuo, Tohru, 4,545,786, Cl. 48-92.000.

Sun Carriers, Inc.: *See—*
Hepp, Peter S., 4,545,710, Cl. 410-32.000.

Sunaga, Tetsuro: *See—*
Asano, Masao; Sunaga, Tetsuro; Murata, Hideki; and Matsumoto, Kazumasa, 4,546,044, Cl. 428-413.000.

Sunago, Katsuyoshi, to Sumitomo Electric Industries, Ltd. Laser beam scanning mirror finely adjusted via joystick. 4,545,657, Cl. 350-600.000.

Sundberg, Ake; and Lindmark, Gunnar, to Aktiebolaget Iggesunds Bruk. Device for use in wood chippers. 4,545,413, Cl. 144-176.000.

Sundberg, Erik G. Sealed lead-acid storage cells. 4,546,053, Cl. 429-57.000.

Sundstrand Corporation: *See—*
Grimm, Duane H., 4,545,470, Cl. 192-56.00R.
Linton, David J., 4,545,202, Cl. 60-420.000.
Peterson, William J.; and Faulkner, Dennis T., 4,546,293, Cl. 318-254.000.

Suzuki, Hirokazu; and Kokado, Masayuki, to Fujitsu Limited. ECL Circuit for forcibly setting a high level output. 4,546,272, Cl. 307-455.000.

Suzuki, Mamoru; and Tanaka, Hiromoto, to Tokyo Electric Power Company Inc., The; and Mitsubishi Denki Kabushiki Kaisha. Training operation system and simulator for training in electric power system. 4,545,767, Cl. 434-224.000.

Suzuki, Ryo; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble device. 4,546,452, Cl. 365-36.000.

Suzuki, Tomonori; and Toyohara, Makoto, to Yamaha Hatsudoki Kabushiki Kaisha. Water-cooled, four-cycle internal combustion engine for outboard motors. 4,545,332, Cl. 123-41.010.

Suzuki, Yasoji; Sasaki, Itsuo; and Abou, Shouji, to Tokyo Shibaura Denki Kabushiki Kaisha. Analog signal power amplifier circuit. 4,546,327, Cl. 330-253.000.

Svecia Silkscreen Maskiner AB: *See—*
Ericsson, Sylve J. D., 4,545,131, Cl. 34-4.000.

Svedberg, Per, to ASEA Aktiebolag. Two-pole overcurrent protection device. 4,546,401, Cl. 361-91.000.

Svoboda, Josef: *See—*
Spitaler, Engelbert; Oberleitner, Gerhard; Svoboda, Josef; Nitschko, Theodor; and Riss, Wilfried, 4,545,598, Cl. 280-612.000.

Swallow, Nancy A.: *See—*
Leshik, Richard R.; Swallow, Nancy A.; Leusner, Steven J.; and DiGiovacchino, David J., 4,546,002, Cl. 426-576.000.

Sweeney, Lawrence E., Jr.: *See—*
Weaver, Charles S.; LeBlanc, Robert A.; and Sweeney, Lawrence E., Jr., 4,546,342, Cl. 340-347.0DD.

Sweeney, William A., to Chevron Research Company. Substituted succinic anhydride/emulsifier composition. 4,545,855, Cl. 162-158.000.

Sweeney, William A., to Chevron Research Company. Stable substituted succinic anhydride/ether-ester emulsifier composition and methods for its use. 4,545,856, Cl. 162-158.000.

Sweeting, Charles W.: *See—*
Bello, Vincent G.; and Sweeting, Charles W., 4,546,421, Cl. 363-21.000.

Swift, Harold E.: *See—*
Innes, Robert A.; and Swift, Harold E., 4,545,943, Cl. 260-465.300.

Swinehart, Steven L.; and Kuhn, Werner H., to Nisus Video Incorporated. Device for continuously varying the shutter speed of a video tape camera. 4,545,659, Cl. 352-216.000.

Swiss Aluminium Ltd.: *See—*
Zulauf, Herbert, 4,545,419, Cl. 164-111.000.

SWS Silicones Corporation: *See—*
Shen, Ming; and McAfee, Richard C., 4,546,164, Cl. 528-15.000.

Szabat, John F., to Mobay Chemical Corporation. Combustion modified flexible polyurethane foam. 4,546,117, Cl. 521-107.000.
Szczypiorski, Wojtek: *See*—
Platek, Stanley W.; Desautels, S. Jerry; and Szczypiorski, Wojtek, 4,545,423, Cl. 164-481.000.
Sziklavaris, Istvan: *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zairos, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.
Szofran, Frank R.: *See*—
Lehoczky, Sandor L.; and Szofran, Frank R., 4,545,848, Cl. 156-616.00R.
Tachikawa, Shoji: *See*—
Kanemura, Shinji; and Tachikawa, Shoji, 4,545,455, Cl. 180-197.000.
Tachikawa Spring Co., Ltd.: *See*—
Kitamura, Masahiro, 4,545,618, Cl. 297-410.000.
Tack, Robert D.: *See*—
Rossi, Albert; Rehrer, David H.; Oswald, Alexis A.; Lewtas, Kenneth; and Tack, Robert D., 4,546,137, Cl. 524-217.000.
Tadokoro, Eiichi: *See*—
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Ryoke, Katsumi; and Tadokoro, Eiichi, 4,546,038, Cl. 428-323.000.
Tafara, Peter T. Method of making a filter bag assembly. 4,545,833, Cl. 156-93.000.
Taflove, Allen: *See*—
Bridges, Jack E.; and Taflove, Allen, 4,545,435, Cl. 166-248.000.
Tago, Toshifumi: *See*—
Masaki, Katsumi; and Tago, Toshifumi, 4,546,449, Cl. 364-900.000.
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, to Yoshitomi Pharmaceutical Industries, Ltd. 1,4-Methano-2-benzazepine derivatives useful as cerebal dysfunction-improving drugs, anti-convulsant, anti-epileptic or anti-anxiety drugs. 4,546,107, Cl. 514-411.000.
Taiyo Yuden Co., Ltd.: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,545,929, Cl. 252-520.000.
Takada, Tadakazu, to Fujitsu Limited. Etching method for semiconductor devices. 4,545,851, Cl. 156-643.000.
Takagi, Fumio: *See*—
Hanamoto, Keiji; and Takagi, Fumio, 4,545,752, Cl. 425-112.000.
Takagi, Kazuhiro: *See*—
Uchida, Yukio; Takagi, Kazuhiro; Katayama, Kiichiro; and Kawase, Hisao, 4,546,051, Cl. 428-653.000.
Takagi, Shoji: *See*—
Nishida, Mitsuhiro; Yamamoto, Sakuei; Sonoda, Nobuo; Okahashi, Kazuo; and Takagi, Shoji, 4,546,130, Cl. 523-459.000.
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, to Hitachi, Ltd. Thermosetting resin composition comprising (1) dicyanamide, (2) polyvalent imide and (3) polymerizable compound. 4,546,168, Cl. 528-107.000.
Takahashi, Hidehiko, to Yakurigaku Chuo Kenkyusho. Pyranone compounds and skin-lightening cosmetic preparations or local demelanizing agents containing the same. 4,545,982, Cl. 424-62.000.
Takahashi, Koji: *See*—
Hiroyasu, Minoru; Yamagishi, Shigeru; Yamashita, Hideo; Yamada, Susumu; and Takahashi, Koji, 4,545,706, Cl. 408-1.0BD.
Takahashi, Toshikatsu: *See*—
Ishitate, Yoshiyuki; and Takahashi, Toshikatsu, 4,545,674, Cl. 355-75.000.
Takahata, Shiro: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.
Takano, Katuto, to Toei Optical Industries Co. Ltd. Focus adjusting device for binocular. 4,545,656, Cl. 350-552.000.
Takao, Mitsunori; and Kimura, Takahiko, to Nippondenso Co., Ltd. Closed-loop mixture controlled fuel injection system. 4,545,355, Cl. 123-489.000.
Takara Co., Ltd.: *See*—
Satoh, Hirohisa, 4,545,777, Cl. 446-457.000.
Takase, Yoshiyuki; Furuta, Ryuji; Kawata, Shigeo; Naruto, Shunsuke; Nakamura, Shinichi; and Minami, Akira, to Dainippon Pharmaceutical Co., Ltd. Glucosaminyl muramyl peptide derivatives. 4,545,932, Cl. 260-112.50R.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,546,101, Cl. 514-253.000.
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, to Fujisawa Pharmaceutical Co., Ltd. New cephem compounds useful for treating infectious diseases in human being and animals and processes for preparation thereof. 4,546,101, Cl. 514-253.000.
Takeda Chemical Industries, Ltd.: *See*—
Kamatani, Yoshio; and Sakamoto, Takurou, 4,546,153, Cl. 525-453.000.
Takeda, Shigetomo: *See*—
Shiba, Haruo; and Takeda, Shigetomo, 4,545,483, Cl. 206-387.000.
Takeda, Yuji: *See*—
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, 4,545,349, Cl. 123-339.000.
Takei, Haruo: *See*—
Kamei, Sadao; Ohashi, Yuichi; Ukai, Toshinao; Yamamuro, Kiyohiko; and Takei, Haruo, 4,546,074, Cl. 430-573.000.
Takemae, Yoshihiro: *See*—
Nozaki, Shigeki; and Takemae, Yoshihiro, 4,546,457, Cl. 365-230.000.
Takeshita, Masatoshi: *See*—
Suzuki, Ryo; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,546,452, Cl. 365-36.000.
Takeuchi, Koji: *See*—
Hirose, Takeshi; Ito, Nobuo; Hirai, Kiyomiki; and Takeuchi, Koji, 4,546,155, Cl. 525-504.000.
Takeuchi, Teruaki: *See*—
Suzuki, Ryo; Takeuchi, Teruaki; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,546,452, Cl. 365-36.000.
TAMPOflex GmbH: *See*—
Reinhold, Holger, 4,545,301, Cl. 101-163.000.
Tamura, Takahiro; Kuno, Hiroaki; Uchikawa, Naoshi; Murayama, Akira; and Mizuno, Takao, to Hitachi, Ltd. Scroll-type compressor. 4,545,747, Cl. 418-55.000.
Tanaka, Akira; Seiki, Kazuo; and Nakamura, Haruyoshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for piecing fasciated yarn. 4,545,193, Cl. 57-261.000.
Tanaka, Hiromoto: *See*—
Suzuki, Mamoru; and Tanaka, Hiromoto, 4,545,767, Cl. 434-224.000.
Tanaka, Kazuhiro: *See*—
Minami, Satoyuki; Tanaka, Kazuhiro; and Nishioka, Takeshi, 4,546,030, Cl. 428-220.000.
Tanaka, Kazuyuki, to Matsushita Electric Industrial Co., Ltd. Display apparatus. 4,546,350, Cl. 340-750.000.
Tanaka, Koji: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.
Tanaka, Ryoichi; and Sakurai, Yasuhiko, to Nippondenso Co., Ltd. Flasher device for automotive vehicle. 4,546,265, Cl. 307-10.0CS.
Tanaka, Shigeru: *See*—
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, 4,545,453, Cl. 180-131.000.
Tanaka, Yasushi: *See*—
Watanabe, Hiroyuki; Osaka, Kuniaki; and Tanaka, Yasushi, 4,545,589, Cl. 280-5.00A.
Tanaka, Yoshikazu: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,545,265, Cl. 74-868.000.
Tanazawa, Hisaji. Method of manufacturing a printed circuit board. 4,545,119, Cl. 29-839.000.
Taniguchi, Yutaka: *See*—
Horikawa, Kazuo; and Taniguchi, Yutaka, 4,546,250, Cl. 250-227.000.
Tanken Seiko Corp.: *See*—
Nagai, Yataro; and Fukuoka, Kazuya, 4,545,588, Cl. 277-93.0SD.
Tanno, Norihiko: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Sato, Hiromi; Tanno, Norihiko; and Yoshida, Noboru, 4,545,936, Cl. 260-377.000.
Tanoue, Toyosuke; Sueyasu, Masanobu; Fukuda, Mitsuichiro; and Matsuo, Tohru, to Sumitomo Metal Industries, Ltd. Apparatus for gasifying solid carbonaceous materials. 4,545,786, Cl. 48-92.000.
Taskovic, Boris. Adjustable width luggage carrier apparatus. 4,545,592, Cl. 280-35.000.
Tate, Harold, Jr.: *See*—
Cook, John; Tate, Harold, Jr.; and Graves, J. W., 4,545,343, Cl. 123-198.00B.
Tateosian, Louis H.: *See*—
Gonser, Donald I.; Eden, George T.; and Tateosian, Louis H., 4,546,261, Cl. 250-492.100.
Tautliner Inc.: *See*—
Broadbent, Edward G., 4,545,611, Cl. 296-181.000.
Taylor, Lloyd D., to Polaroid Corporation. Eliminating polymers useful in diffusion control layers. 4,546,159, Cl. 526-286.000.
TDK Corporation: *See*—
Shiba, Haruo; and Takeda, Shigetomo, 4,545,483, Cl. 206-387.000.
Teagle, David A.: *See*—
Coetzer, Johan; Galloway, Roy C.; Bones, Roger J.; Teagle, David A.; and Moseley, Patrick T., 4,546,055, Cl. 429-103.000.
Tegethoff, Ronald H., to AT&T Bell Laboratories. Echo suppressor for improving echo canceler performance. 4,546,216, Cl. 179-170.200.
Tehrani, Abolghassem Y.; Jones, John N.; and Allington, Robert W., to ISCO, Inc. Apparatus for reducing tailing in a liquid chromatograph. 4,545,904, Cl. 210-96.100.
Teijin Limited: *See*—
Yoshimoto, Masato; and Ohwaki, Shinji, 4,546,043, Cl. 428-397.000.
Tektronix, Inc.: *See*—
Bateman, Glenn; and DuPuy, Richard E., Jr., 4,546,321, Cl. 328-142.000.
Cabot, Richard C., 4,546,270, Cl. 307-353.000.
Telford, Thomas M.; and Haase, James W., to Warn Industries, Inc. Winch power transmission. 4,545,567, Cl. 254-344.000.
Temple, Robert E.: *See*—
DaSilva, Marcus K.; Whipple, David P.; and Temple, Robert E., 4,546,331, Cl. 332-19.000.
Tension Envelope Corporation: *See*—
Hiersteiner, Walter, 4,545,521, Cl. 229-68.00R.
Tenud, Leander: *See*—
Previdoli, Felix; and Tenud, Leander, 4,545,934, Cl. 260-239.00E.
Terauchi, Kiyoshi: *See*—
Sugimoto, Kazuo; Shimizu, Shigemi; and Terauchi, Kiyoshi, 4,545,746, Cl. 418-55.000.
Terlecky, Boris S.: *See*—
Brodeur, Rene H.; and Terlecky, Boris S., 4,545,304, Cl. 105-3.000.

Texaco Inc.: *See*—
Elattar, Azza A., 4,545,797, Cl. 65-19.000.
Sammells, Anthony F.; and Pa Ang, Peter G., 4,545,872, Cl. 204-72.000.
Texas A&M University System, The: *See*—
Rhee, Khee C.; and Lusas, E. W., 4,546,004, Cl. 426-656.000.
Texas Instruments Incorporated: *See*—
Curran, Patrick A., 4,546,370, Cl. 357-43.000.
Lau, Chi K., 4,545,116, Cl. 29-591.000.
Spinelli, Thomas S.; Manns, William G.; and Weirauch, Donald F., 4,546,406, Cl. 361-386.000.
Thelander, Sidsel: *See*—
Karlberg, Bo I.; and Thelander, Sidsel, 4,546,088, Cl. 436-178.000.
Thiem, Carol J.; Lavering, Gordon R.; and Valier, Gerald A., to Varian Associates, Inc. Fast-acting tuner for multiple-channel klystrons. 4,546,325, Cl. 330-45.000.
Thomas & Betts Corporation: *See*—
Dienes, Zoltan B.; and Mineur, Thomas L., 4,545,830, Cl. 156-48.000.
Thomas Industries, Inc.: *See*—
LaBelle, Charles E., 4,545,405, Cl. 137-524.000.
Thomas Willett & Co. Ltd.: *See*—
Walton, Francis R., 4,545,736, Cl. 417-63.000.
Thompson, John A. Process for producing alkali metal ferrates utilizing hematite and magnetite. 4,545,974, Cl. 423-594.000.
Thomson CSF: *See*—
Bui-Hai, Nhu, 4,546,359, Cl. 343-781.00R.
Bui-Hai, Nhu, 4,546,471, Cl. 370-123.000.
Chambron, Edmond, 4,545,571, Cl. 269-322.000.
Delgrange, Louis, 4,546,289, Cl. 315-169.400.
Dubois, Jean-Claude; Ravaux, Gilles; and Le Barny, Pierre, 4,545,921, Cl. 252-299.620.
Thuis, Robbert C.: *See*—
Nieveen van Dijkum, Adalbertus H. J.; Thuis, Robbert C.; and Zandveld, Paul, 4,546,371, Cl. 357-51.000.
Tie-Tite Products, Inc.: *See*—
Blum, Ronald D., 4,545,138, Cl. 36-51.000.
Tiedje, J. Thomas: *See*—
Exxon Research and Engineering Co.; Tiedje, J. Thomas; Morel, Don L.; and Abeles, Benjamin, 4,546,009, Cl. 427-39.000.
Tiit, Valdur M.: *See*—
Denisov, Roman A.; Tiit, Valdur M.; and Feldbakh, Eduard K., 4,546,256, Cl. 250-372.000.
Tinebor, Manfred; Matthies, Gustav; and Karl, Heinz-Dietmar, to Maschinenfabrik Stahlkontor Weserlenze GmbH & Co. Circuit and method for controlling an alternating or three-phase current motor. 4,546,301, Cl. 318-798.000.
Tinker, Craig S., to Pall Corporation. Microcomputer control system for desiccant dryer. 4,546,442, Cl. 364-500.000.
Tischler, Heinrich: *See*—
Maier, Gernot; Tischler, Heinrich; Wohr, Rolf; and Schwarzhoff, Wolfgang, 4,545,632, Cl. 339-18.00R.
Tisseyre, Jean-Paul: *See*—
Le Foyer de Costil, Carol; Ayache, Liliane; and Tisseyre, Jean-Paul, 4,545,990, Cl. 514-557.000.
Tivis, Layne C.: *See*—
Pearman, Bruce W.; Pelton, Clark; Roper, Todd K.; and Tivis, Layne C., 4,545,583, Cl. 273-311.000.
TLV Co., Ltd.: *See*—
Yumoto, Hideaki, 4,545,397, Cl. 137-192.000.
TMC Corporation: *See*—
Spitaler, Engelbert; Oberleitner, Gerhard; Svoboda, Josef; Nitschko, Theodor; and Riss, Wilfried, 4,545,598, Cl. 280-612.000.
Toa Grout Kogyo Co., Ltd.: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,545,702, Cl. 405-269.000.
Toben, Michael P.: *See*—
Martin, James L.; McCaskie, John E.; and Toben, Michael P., 4,545,868, Cl. 204-47.000.
Tocksfors Verkstads AB: *See*—
Ahs, Vilgot, 4,546,238, Cl. 219-497.000.
Toda, Junzo; and Hiyane, Masao, to Fujitsu Limited. Perpendicular magnetic recording and reproducing head. 4,546,398, Cl. 360-126.000.
Toda, Yoshio: *See*—
Nagumo, Shinichi; Toda, Yoshio; Nakajima, Yasuo; and Hase, Yoshifumi, 4,545,333, Cl. 123-41.020.
Todd, Anthony G.; and Wickenden, Dennis K., to General Electric Company, p.l.c., The. Semiconductor device with a tantalum iridium barrier layer contact structure. 4,546,373, Cl. 357-67.000.
Todd, Bruce C.: *See*—
Moore, David J.; Byers, Larry L.; Kurth, Duane G.; Bordsen, Donald T.; Honkomp, John R.; Todd, Bruce C.; and Malek, Robert M., 4,546,430, Cl. 364-200.000.
Todd, Robert W. Wide span overhead door. 4,545,417, Cl. 160-207.000.
Todoh, Hidemasa, to Fuji Xerox Co., Ltd. Head for electrostatic recording. 4,546,364, Cl. 346-155.000.
Toei Optical Industries Co. Ltd.: *See*—
Takano, Katuto, 4,545,656, Cl. 350-552.000.
Toftness, Irwing N., to Toftness Post-Graduate School of Chiropratic Inc. Antenna structure for collection and detection of radiation. 4,545,383, Cl. 128-653.000.
Toftness Post-Graduate School of Chiropratic Inc.: *See*—
Toftness, Irwing N., 4,545,383, Cl. 128-653.000.
Toida, Takashi: *See*—
Nakata, Toshikazu; and Toida, Takashi, 4,546,376, Cl. 357-23.700.
Toko Kabushiki Kaisha: *See*—
Sakai, Koichi, 4,546,274, Cl. 307-494.000.
Toko Yakuhin Industry Co., Ltd.: *See*—
Kamishita, Takuzo, 4,545,992, Cl. 514-161.000.
Tokuume, Yoshihiro; and Sato, Hideaki, to Canon Kabushiki Kaisha. Information recording and reproducing apparatus. 4,546,392, Cl. 360-30.000.
Tokyo Electric Power Co., Inc.: *See*—
Maeda, Takafumi; and Mine, Setsurou, 4,546,303, Cl. 323-210.000.
Suzuki, Mamoru; and Tanaka, Hiromoto, 4,545,767, Cl. 434-224.000.
Tokyo Land Corporation: *See*—
Inokawa, Michio; Watanabe, Minoru; Miyasaka, Yoshiteru; and Watanabe, Toshio, 4,545,292, Cl. 98-42.210.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ando, Hideo, 4,546,460, Cl. 369-45.000.
Ikeda, Takashi; and Odawara, Masachika, 4,545,725, Cl. 415-180.000.
Ishida, Katsuyuki; and Ikeda, Naotaka, 4,545,220, Cl. 68-133.000.
Iwahashi, Hiroshi; and Ochii, Kiyofumi, 4,546,455, Cl. 365-200.000.
Kanuma, Akira, 4,546,450, Cl. 364-900.000.
Kasagi, Yoshitaka; and Aketagawa, Tokio, 4,546,377, Cl. 358-23.000.
Kawachi, Tatsuhiko, 4,545,384, Cl. 128-653.000.
Kuze, Takashi, 4,546,049, Cl. 428-621.000.
Nakata, Junji, 4,545,155, Cl. 51-320.000.
Nambu, Shigeo, 4,546,351, Cl. 340-825.500.
Okado, Chihiro, 4,546,422, Cl. 363-41.000.
Seki, Nagataka, 4,546,423, Cl. 363-56.000.
Suzuki, Yasoji; Sasaki, Itsuo; and Abou, Shouji, 4,546,327, Cl. 330-253.000.
Tomita, Toyofumi, 4,545,257, Cl. 73-861.170.
Tsukakoshi, Tsuneo; and Ohashi, Hiromichi, 4,546,369, Cl. 357-39.000.
Uchida, Kuniharu; Nagai, Satoshi; and Komura, Ichiroh, 4,545,251, Cl. 73-631.000.
Zaitsu, Hirohachi, 4,545,668, Cl. 355-3.00R.
Tol-O-Matic, Inc.: *See*—
Lieberman, Walter G., 4,545,290, Cl. 92-88.000.
Tolnay, Lajos: *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.
Tomala, Ambrose: *See*—
Brooks, Mark A.; Tomala, Ambrose; and Casey, Gary L., 4,545,339, Cl. 123-145.00A.
Tomioka, Shunzoo; Nakano, Masaaki; Okano, Kinpei; Shimizu, Kousaku; and Yoda, Hiroaki, to Hitachi, Ltd. Vertical motor pump. 4,545,741, Cl. 417-365.000.
Tomishima, Takeshi: *See*—
Gotah, Eizo; Tomishima, Takeshi; Tsutsumi, Tadao; and Komuro, Yoshiyuki, 4,546,171, Cl. 528-310.000.
Tomita, Osamu; Murase, Yoshihiko; and Nishimura, Seiya, to Nippon Gakki Seizo Kabushiki Kaisha. Wood-type golf club head. 4,545,580, Cl. 273-167.00R.
Tomita, Seisuke: *See*—
Itoh, Michio; Tsukamoto, Takehiro; Watanabe, Shuichi; Kinoshita, Takeshi; and Tomita, Seisuke, 4,545,416, Cl. 152-539.000.
Tomita, Toyofumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electromagnetic flow meter. 4,545,257, Cl. 73-861.170.
Tonan Kaihatsu Kogyo Co., Ltd.: *See*—
Sano, Sakae; Kitajima, Hisashi; Iimori, Hiroshi; and Nishio, Tadashi, 4,545,702, Cl. 405-269.000.
Toray Industries, Inc.: *See*—
Arita, Yosihumi; Murakami, Yukihiro; and Yuasa, Miyabi, 4,545,762, Cl. 432-59.000.
Gotah, Eizo; Tomishima, Takeshi; Tsutsumi, Tadao; and Komuro, Yoshiyuki, 4,546,171, Cl. 528-310.000.
Minami, Satoyuki; Tanaka, Kazuhiro; and Nishioka, Takeshi, 4,546,030, Cl. 428-220.000.
Sakai, Masaaki; Sato, Kenji; and Yamagata, Seiichi, 4,546,020, Cl. 428-16.000.
Toray Silicone Company, Ltd.: *See*—
Kadono, Motoaki, 4,545,506, Cl. 222-95.000.
Ryuzo, Mikami; and Nakasuji, Katsuyoshi, 4,546,018, Cl. 427-407.200.
Torrance, Donald M., to Torrance, Donald MacNeil; and Barbour, Mathew. Liquid transfer device. 4,545,145, Cl. 47-48.500.
Torrance, Donald MacNeil: *See*—
Torrance, Donald M., 4,545,145, Cl. 47-48.500.
Toshiba Tungaloy Co., Ltd.: *See*—
Hirano, Shin-ichi; and Naka, Shigeharu, 4,545,968, Cl. 423-290.000.
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, to Lenin Kohaszati Muvek. Process for the production of steels of low carbon content wherein the carbon end point and blow temperature are controlled. 4,545,815, Cl. 75-49.000.
Tovenrath, Claus; and Tovenrath, Frank, to Lindauer Dornier Gesellschaft mbH. Device for individually separating and readying warp threads for threading into heddles and drop wires. 4,545,099, Cl. 28-202.000.
Tovenrath, Frank: *See*—
Tovenrath, Claus; and Tovenrath, Frank, 4,545,099, Cl. 28-202.000.
Toy, Malcolm D. Method and apparatus for displaying garments. 4,545,514, Cl. 223-66.000.

Toyo Machinery Co., Ltd.: *See*—
Miyai, Masuo, 4,545,516, Cl. 226-20.000.
Toyoda Gosei Co., Ltd.: *See*—
Kato, Taizo; and Souchi, Toshiyuki, 4,545,548, Cl. 242-156.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Fujiwara, Hidetoshi, 4,545,449, Cl. 180-69.300.
Toyohara, Makoto: *See*—
Suzuki, Tomonori; and Toyohara, Makoto, 4,545,332, Cl. 123-41.010.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ido, Akinori; and Uchida, Goro , 4,545,526, Cl. 237-12.30A.
Ito, Yoshiyasu; Suematsu, Toshio; Takeda, Yuji; and Anzai, Katsushi, 4,545,349, Cl. 123-339.000.
Nakagawa, Takayoshi; and Hasegawa, Tadao, 4,545,334, Cl. 123-41.330.
Nakamura, Norihiko; and Kato, Takashi, 4,545,350, Cl. 123-439.000.
Watanabe, Hiroyuki; Osaka, Kuniaki; and Tanaka, Yasushi, 4,545,589, Cl. 280-5.00A.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Kosuda, Tooru; Hattori, Kyo; and Sakurai, Kazuhiro, 4,546,338, Cl. 335-229.000.
Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Tsuboi, Yoshimasa, 4,545,758, Cl. 431-208.000.
Trac 4 Inc.: *See*—
Jones, Donald D., 4,545,458, Cl. 180-255.000.
Trachte, Dietrich: *See*—
Hofmann, Karl; and Trachte, Dietrich, 4,545,530, Cl. 239-73.000.
Traunecker, Werner: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; Traunecker, Werner; and Reichl, Richard, 4,546,102, Cl. 514-259.000.
Treadway, John E. Attachment for pneumatic hammers for punching holes of varying size. 4,545,440, Cl. 173-132.000.
Treadwell, Stephen S.; and Isett, Donald D., to Microdynamics, Inc. Method and apparatus for accurately controlling the seam margins produced by a semi-automatic sewing machine. 4,545,310, Cl. 112-121.110.
Trego, Brian R.: *See*—
Flackett, Dale R.; Jonas, Reinhard; and Trego, Brian R., 4,546,017, Cl. 427-387.000.
Trembley, John F.; and Hull, John L., to Entron Technologies, Inc. Method and apparatus for the conveying and radio frequency processing of dielectric materials. 4,546,226, Cl. 219-10.810.
Triangle Grinding Inc.: *See*—
Benson, Lloyd R., 4,545,705, Cl. 407-108.000.
Tridon, M.: *See*—
Barriquand, B.; Villard, F.; Martin, M.; Tridon, M.; and Pignal, M., 4,545,135, Cl. 34-58.000.
Triplite Limited: *See*—
Plucknett, Derek W., 4,545,543, Cl. 242-47.010.
Triumph-Adler Aktiengesellschaft bur Buro- und Informationstechnik: *See*—
Fischer, Dieter; and Vatterott, Karl-Heinz, 4,546,288, Cl. 315-169.400.
Trojan, Paul K.: *See*—
Bilek, Paul J.; Flinn, Richard A.; McCluhan, Thomas K.; and Trojan, Paul K., 4,545,817, Cl. 75-123.00E.
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F. Method and apparatus for automatically making snow. 4,545,529, Cl. 239-2.00S.
Tropeano, Joseph T.: *See*—
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F., 4,545,529, Cl. 239-2.00S.
Tropeano, Thomas F.: *See*—
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F., 4,545,529, Cl. 239-2.00S.
Trotter, Ralph R.: *See*—
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Herb, Eugen, 4,545,272, Cl. 83-165.000.
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Jagst, Peter, 4,545,093, Cl. 19-159.00R.
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Buie, James L., 4,546,456, Cl. 365-227.000.
Matay, Istvan M., 4,545,249, Cl. 73-597.000.
Meyers, Robert A.; and Hart, Walter D., 4,545,891, Cl. 208-11.00R.
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Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, to Nichias Corporation; and Japan Exlan Company, Ltd. Gasket sheet. 4,546,033, Cl. 428-290.000.
Tsuchiya, Masahiko; and Kuwabara, Hirofumi, to Tsuchiya, Masahiko. Apparatus for producing sample ions. 4,546,253, Cl. 250-288.000.
Tsukakoshi, Tsuneo; and Ohashi, Hiromichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Light-activated amplified gate bi-directional thyristor. 4,546,369, Cl. 357-39.000.
Tsukamoto, Takehiro: *See*—
Itoh, Michio; Tsukamoto, Takehiro; Watanabe, Shuichi; Kinoshita, Takeshi; and Tomita, Seisuke, 4,545,416, Cl. 152-539.000.
Tsuno, Kazuhiko: *See*—
Sano, Nichiro; and Tsuno, Kazuhiko, 4,545,565, Cl. 251-331.000.
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Miyajiri, Tetsuo; Habasaki, Toshimi; Yokota, Hiroshi; Tsurita, Tamio; and Nakahara, Motohiro, 4,545,801, Cl. 65-157.000.
Tsuruhara, Kenji: *See*—
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Tsuruya, Tetsuo: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,545,809, Cl. 71-92.000.
Tsutsumi, Tadao: *See*—
Gotah, Eizo; Tomishima, Takeshi; Tsutsumi, Tadao; and Komuro, Yoshiyuki, 4,546,171, Cl. 528-310.000.
Tsuzuki, Junichi. Tunnel wall structure. 4,545,701, Cl. 405-153.000.
Tubiola, Peter J.: *See*—
Lakritz, Mark N.; Ordonez, Jose; and Tubiola, Peter J., 4,545,610, Cl. 29-589.000.
Tucci, Charles A., to Cordis Corporation. Detachable balloon catheter and method of use. 4,545,367, Cl. 128-1.00R.
Tucker, Christopher J., to GEC Avionics Limited. Arrangement for processing data in a two-dimensional array. 4,546,433, Cl. 364-200.000.
Turbowitz, Leslie D.: *See*—
Pipa, William J.; and Turbowitz, Leslie D., 4,545,451, Cl. 180-70.100.
Turczyn, Mark T., to United States of America, Agriculture. Device for simulating stress on packages during coupling of railcars. 4,545,236, Cl. 73-12.000.
Tylo Sauna S.A.: *See*—
Janson, Mats O., 4,546,236, Cl. 219-365.000.
U C B Societe Anonyme: *See*—
Degelaen, Jacques; Loffet, Albert; and Durieux, Jean-Pierre, 4,546,076, Cl. 435-24.000.
UBE Industries, Ltd.: *See*—
Kobayashi, Waichi; Yoshida, Kozaburo; and Igarashi, Hideaki, 4,545,975, Cl. 423-636.000.
Uchida, Goro : *See*—
Ido, Akinori; and Uchida, Goro , 4,545,526, Cl. 237-12.30A.
Uchida, Hiroshi; Nakanishi, Kazuo; Kiriake, Masaharu; and Shimano, Akira. Transporting system for various kinds of cops. 4,545,551, Cl. 242-35.50A.
Uchida, Kuniharu; Nagai, Satoshi; and Komura, Ichiroh, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic scanning type ultrasonic non-destructive testing apparatus. 4,545,251, Cl. 73-631.000.
Uchida, Masami: *See*—
Inoue, Takao; Maeda, Yukio; and Uchida, Masami, 4,546,464, Cl. 369-280.000.
Uchida, Yukio; Takagi, Kazuhiro; Katayama, Kiichiro; and Kawase, Hisao, to Nisshin Steel Co., Ltd. Aluminum coated steel sheet and process for producing the same. 4,546,051, Cl. 428-653.000.
Uchikawa, Naoshi: *See*—
Tamura, Takahiro; Kuno, Hiroaki; Uchikawa, Naoshi; Murayama, Akira; and Mizuno, Takao, 4,545,747, Cl. 418-55.000.
Uemura, Toshio: *See*—
Morita, Shigeki; Masai, Tadahisa; Nakashita, Shigeto; Uemura, Toshio; Kouda, Fumio; and Nawata, Tsuyoshi, 4,545,307, Cl. 110-264.000.
Uffner, William E.; and White, Robert N., to Owens-Corning Fiberglas Corporation. Primer composition for a laminated repaired road. 4,545,699, Cl. 404-31.000.
Ukai, Toshinao: *See*—
Kamei, Sadao; Ohashi, Yuichi; Ukai, Toshinao; Yamamuro, Kiyohiko; and Takei, Haruo, 4,546,074, Cl. 430-573.000.
Ullrich, Manfred; Reutler, Herbert; and Schepers, Hubert, to GHT Gesellschaft fur Hochtemperaturreaktor-Technik mbH. Device for shutting down a high-temperature nuclear reactor. 4,545,954, Cl. 376-220.000.
Umbra Shades Ltd.: *See*—
Rowan, Paul D., 4,545,687, Cl. 368-232.000.
Umemura, Mamoru; and Yokota, Minoru, to NEC Corporation. Prolog processing system. 4,546,432, Cl. 364-200.000.
Une, Misuho: *See*—
Mosbach, Erwin H.; Une, Misuho; and McSherry, Charles K., 4,545,938, Cl. 260-397.100.
Unger, John D., to Motorola, Inc. Frequency synthesizers adaptive loop filter with compensation for transients. 4,546,329, Cl. 331-16.000.
Union Carbide Corporation: *See*—
Nausedas, Joseph A.; and Beckman, John H., 4,545,091, Cl. 17-49.000.
Wood, Edgar A., 4,545,513, Cl. 222-632.000.
Union Oil Company of California: *See*—
Kelley, Arnold E.; Block, Michael J.; and Skripek, Milan R., 4,545,859, Cl. 201-17.000.
Union Siderurgique du Nord et de L'est da la France (USINOR) S.A.: *See*—
Lyskawa, Edmond; Roger, Paul; Marquis, Jean; and Canivez, Etienne, 4,545,860, Cl. 201-41.000.
Uniroyal, Ltd.: *See*—
Ims, Horst O. H., 4,545,735, Cl. 417-307.000.
United Kingdom Atomic Energy Authority: *See*—
Inoue, Shigeyasu; and Yamamoto, Hiroyoshi, 4,545,818, Cl. 106-22.000.

United States of America
Agriculture: *See*—
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Air Force: *See*—
Adamo, Michael D.; Darter, Cederick U.; and Cho, Frederick Y., 4,546,283, Cl. 310-313.00R.
Caldwell, Stephen P.; and Pedersen, David R., 4,546,268, Cl. 307-265.000.
Chan, Robert H. G.; Mann, Martin R.; and Ciarrocchi, John A., 4,546,429, Cl. 364-200.000.
Higgins, Charles H.; and Skipper, John D., 4,546,343, Cl. 340-347.0AD.
Ott, William E., 4,546,320, Cl. 328-3.000.
Smith, Edwin B.; and Fogleboch, John R., Sr., 4,546,328, Cl. 331-4.000.
Stockton, William W., 4,546,353, Cl. 340-966.000.
Vasilos, Thomas, 4,546,032, Cl. 428-223.000.
Army: *See*—
Edlin, George R.; Shumpert, Thomas H.; and Strickland, Brian R., 4,546,358, Cl. 343-703.000.
Starkenberg, John J.; and Gibbons, Gould, Jr., 4,545,829, Cl. 149-109.600.
Energy: *See*—
Moore, David S.; and Schmidt, Stephen C., 4,545,679, Cl. 356-301.000.
Moyer, Robert D., 4,546,313, Cl. 324-103.00P.
Zendle, Robert, 4,546,259, Cl. 250-484.100.
Health and Human Services: *See*—
Pastan, Ira; Willingham, Mark C.; and Fitzgerald, David J., 4,545,985, Cl. 424-85.000.
Pitha, Josef, 4,546,097, Cl. 514-26.000.
National Aeronautics and Space Administration: *See*—
Clark, Keith H., 4,545,723, Cl. 414-730.000.
Craig, Glenn D., 4,546,248, Cl. 250-225.000.
Finke, Robert C.; and Banks, Bruce A., 4,545,553, Cl. 244-134.00D.
Reynolds, George H.; Elsner, Norbert B.; and Shearer, Clyde H., 4,545,967, Cl. 423-263.000.
von Pragenau, George L., 4,545,586, Cl. 277-53.000.
Navy: *See*—
Hinton, George F., 4,546,317, Cl. 324-301.000.
Sitzmann, Michael E.; and Adolph, Horst G., 4,546,200, Cl. 560-222.000.
Whitehouse, Harper J.; and McKnight, William H., 4,546,249, Cl. 250-227.000.
Young, Christopher M.; and Cowen, Steven J., 4,545,643, Cl. 350-96.200.
U.S. Philips Corporation: *See*—
Annegarn, Marcellinus J. J. C., 4,546,378, Cl. 358-31.000.
Chisholm, Thomas, 4,546,258, Cl. 250-396.00R.
De Vries, Jochem J., 4,545,120, Cl. 30-34.200.
Franx, Cornelis, 4,545,889, Cl. 204-406.000.
Goddijn, Bernardus H. A., deceased; and de Haan, Friedrich J., administrator, 4,546,305, Cl. 323-299.000.
Heuvelmans, Jean J.; Couwenberg, Winston D.; and Ligthart, Franciscus A. S., 4,546,285, Cl. 313-25.000.
Kleefstra, Meindert J., 4,546,488, Cl. 378-49.000.
Knochel, Reinhard, 4,546,311, Cl. 324-58.50R.
Kowalski, Gunter, 4,546,384, Cl. 358-107.000.
Krijl, Gerrit; and Van de Leest, Renaat E., 4,545,871, Cl. 204-56.00R.
Maas, Henricus G. R.; Klaassen, Francois M.; and Appels, Johannes A., 4,545,110, Cl. 29-571.000.
Maijers, Andries C.; and Vos, Jan, 4,546,209, Cl. 174-52.0PE.
Meerman, Wilhelmus C. P. M., 4,546,484, Cl. 373-27.000.
Nieveen van Dijkum, Adalbertus H. J.; Thuis, Robbert C.; and Zandveld, Paul, 4,546,371, Cl. 357-51.000.
Opheij, Willem G.; and van Rosmalen, Gerard E., 4,546,463, Cl. 369-110.000.
Renardus, Max L. P.; and Sieswerda, Bauke, 4,546,284, Cl. 313-25.000.
Van Gils, Wilhelmus M. J.; Moliet, Adrianus J. T.; and Ridders, Johannes A. M., 4,545,774, Cl. 445-22.000.
Van Uffelen, Jean-Pierre H.; Robillard, Daniel; and LeBourg, Michel, 4,546,326, Cl. 330-129.000.
United States Steel Corporation: *See*—
Martin, Wayne A.; and Modic, Justin G., 4,545,232, Cl. 72-356.000.
Redwine, Fletcher H., 4,545,404, Cl. 137-516.290.
Walewski, Leonard M., 4,546,142, Cl. 524-487.000.
United Technologies Corporation: *See*—
Bello, Vincent G.; and Sweeting, Charles W., 4,546,421, Cl. 363-21.000.
Dudash, Carl S., 4,545,407, Cl. 137-596.000.
Lopiccolo, Mario T., 4,546,466, Cl. 370-3.000.
McGivern, James F., Jr., 4,545,876, Cl. 204-130.000.
Ryan, Edward J., 4,546,047, Cl. 428-565.000.
Shuskus, Alexander J., 4,546,372, Cl. 357-52.000.
Wehnert, George J.; and Richter, Stanley J., 4,545,837, Cl. 156-191.000.
Unitika Ltd.: *See*—
Ohshima, Toshihisa; and Soda, Kenji, 4,546,077, Cl. 435-26.000.
Univ. of California, Regents of the: *See*—
Kurjan, Janet; and Herskowitz, Ira, 4,546,082, Cl. 435-172.300.
University of Delaware: *See*—
Bulkowski, John E., 4,545,937, Cl. 260-396.00R.
University of Manchester Institute of Science and Technology, The: *See*—
Atkinson, Bernard; Black, Geoffrey M.; Pinches, Anthony; and Lewis, Paul J. S., 4,545,909, Cl. 210-618.000.
Upadek, Horst; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Terpene derivatives and perfume compositions containing them. 4,545,930, Cl. 252-522.00R.
Upjohn Company, The: *See*—
Alberino, Louis M.; Regelman, Dale F.; and Vespoli, Nancy P., 4,546,114, Cl. 521-51.000.
Gammill, Ronald B., 4,546,177, Cl. 544-58.700.
Urfirer, Steven. Modular equipment connection. 4,546,267, Cl. 307-116.000.
Urrestarazu-Borda, Rafael. Combination key. 4,545,226, Cl. 70-411.000.
Ushikoshi, Kenichi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,545,686, Cl. 368-63.000.
USS Engineers & Consultants, Inc.: *See*—
Shapland, Earl P.; and King, Patrick D., 4,545,512, Cl. 222-600.000.
Ustav pro vyzkum motorovych vozidel: *See*—
Hau, Antonin; Srubar, Jiri ; Esenovskij-Laskov, Jurij K.; and Giruckij, Olgert I., 4,545,264, Cl. 74-688.000.
Vaisman, Jakov. Multi-lateral edge unit having an asymmetrical design that extends to the lateral edges. 4,546,025, Cl. 428-47.000.
Val, Christian, to Compagnie d'Informatique Militaire Spatiale & Aeronautique. Composite substrate with high heat conduction. 4,546,028, Cl. 428-116.000.
Valdiserri, Leo L.; and Woodbury, Richard P., to Borg-Warner Chemicals, Inc. Process for preparing phosphite-isocyanurates oligomers. 4,546,180, Cl. 544-214.000.
Valeo: *See*—
Alas, Jacques, 4,545,473, Cl. 192-106.200.
Caray, Andre , 4,545,468, Cl. 192-106.200.
Caray, Andre , 4,545,472, Cl. 192-98.000.
Valier, Gerald A.: *See*—
Thiem, Carol J.; Lavering, Gordon R.; and Valier, Gerald A., 4,546,325, Cl. 330-45.000.
Vamvakas, Michael. Label disposal filter. 4,545,908, Cl. 210-256.000.
Van de Leest, Renaat E.: *See*—
Krijl, Gerrit; and Van de Leest, Renaat E., 4,545,871, Cl. 204-56.00R.
van der Brug, Gerard J.: *See*—
Wolf, Joost M.; Post, Hendrik A.; Stigter, Willem H.; van der Brug, Gerard J.; and Sieben, Joannes H. F. C., 4,545,550, Cl. 242-200.000.
vander Linden, John: *See*—
Bradley, Earl C., Jr.; and vander Linden, John, 4,545,707, Cl. 408-111.000.
Van Dyke, James A.: *See*—
Prewitt, William T.; and Van Dyke, James A., 4,546,438, Cl. 364-473.000.
Van Gils, Wilhelmus M. J.; Mollet, Adrianus J. T.; and Ridders, Johannes A. M., to U.S. Philips Corporation. Method of manufacturing a low-pressure mercury vapor discharge lamp and low-pressure mercury vapor discharge lamp manufactured by this method. 4,545,774, Cl. 445-22.000.
Van Grouw, Samuel J.: *See*—
Smith, Richard D.; and Van Grouw, Samuel J., 4,545,360, Cl. 126-76.000.
Vanhumbeeck, Jacky; Danneels, Laurent; De Steur, Hubert; and Heyneman, Guido, to Siemens Aktiengesellschaft. Analysis system for determining copper content in waste water. 4,545,957, Cl. 422-81.000.
van Olst, Gijsbrecht H. J. Venting device. 4,545,398, Cl. 137-216.200.
Van Ooyen, Richard C., to J. I. Case Company. Crawler track tensioning and drive system. 4,545,624, Cl. 305-9.000.
van Rosmalen, Gerard E.: *See*—
Opheij, Willem G.; and van Rosmalen, Gerard E., 4,546,463, Cl. 369-110.000.
Van Slooten, Robert W.: *See*—
Sharpless, Charles H.; and Van Slooten, Robert W., 4,546,475, Cl. 371-49.000.
Van Uffelen, Jean-Pierre H.; Robillard, Daniel; and LeBourg, Michel, to U.S. Philips Corporation. Fast automatic gain control arrangement. 4,546,326, Cl. 330-129.000.
Varian Associates, Inc.: *See*—
Thiem, Carol J.; Lavering, Gordon R.; and Valier, Gerald A., 4,546,325, Cl. 330-45.000.
Varner, George C., to Milliken Research Corporation. Pattern designs printed with computer controlled pattern dyeing device. 4,545,086, Cl. 8-151.000.
Vascutek Limited: *See*—
Hood, Robert G., 4,545,082, Cl. 623-1.000.
Vasilos, Thomas, to United States of America, Air Force. Fiber reinforced carbon/carbon composite structure with tailored directional shear strength properties. 4,546,032, Cl. 428-223.000.
Vatterott, Karl-Heinz: *See*—
Fischer, Dieter; and Vatterott, Karl-Heinz, 4,546,288, Cl. 315-169.400.
Vaughan, Thomas L., to Warner-Lambert Company. Rigid medical solution container. 4,545,783, Cl. 604-259.000.
Veale, John R., to Manhattan Engineering Co., Inc. Low cost servo operated digital positioning system. 4,546,299, Cl. 318-608.000.
Velsicol Chemical Corporation: *See*—
Luteri, George F.; Stach, Leonard J.; and Nickell, Louis G., 4,546,196, Cl. 560-65.000.

Nickell, Louis G.; Stach, Leonard J.; and Luteri, George F., 4,545,813, Cl. 71-107.000.

Verdenne, Serge; Brocard, Didier; Hardouin, Pierre; and Lameyre, Felix, to La Telemecanique Electrique. Device for fixing by screwing onto a channel section and the combination of a channel section and such a device. 4,545,697, Cl. 403-230.000.

Verla-Pharm, Arzneimittelfabrik, Apotheker H.J.v. Ehrlich GmbH & Co. KG: *See*—
Helbig, Joachim; and Schmidbaur, Hubert, 4,546,195, Cl. 556-50.000.

Vespoli, Nancy P.: *See*—
Alberino, Louis M.; Regelman, Dale F.; and Vespoli, Nancy P., 4,546,114, Cl. 521-51.000.

Viaud, Jean, to Deere & Company. Cylindrical baler hydraulic circuit for controlling bale chamber tension and operating bale discharge gate. 4,545,298, Cl. 100-88.000.

Victor Company of Japan Limited: *See*—
Mori, Takaro; Saito, Susumu; and Fujii, Yasuhiko, 4,546,393, Cl. 360-40.000.

Villa, Giovanni: *See*—
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Villamil, Clara I.: *See*—
Miyano, Masateru; Villamil, Clara I.; and Shone, Robert L., 4,546,194, Cl. 549-401.000.

Villard, F.: *See*—
Barriquand, B.; Villard, F.; Martin, M.; Tridon, M.; and Pignal, M., 4,545,135, Cl. 34-58.000.

Villena, Edgardo I.: *See*—
Cage, James K.; and Villena, Edgardo I., 4,545,953, Cl. 264-533.000.

Vischer, Daniel; and Volkart, Peter, to Brombach, Hansjorg; and Hohlwegler, Heinrich. Flow regulating device. 4,545,403, Cl. 137-497.000.

Visconti, Alfonso; Sernagiotto, Emilio; and Sernagiotto, Raffaello M., to Officine Meccaniche Sernagiotto. Apparatus for automatically controlling the sedimentation of muds during the purification of waste waters. 4,545,903, Cl. 210-96.100.

Vodra, Richard J. Door latch assembly. 4,545,606, Cl. 292-92.000.

Voest-Alpine Aktiengesellschaft: *See*—
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; Zajicek, Ernst; and Puhringer, Othmar, 4,546,483, Cl. 373-24.000.

Vogtel, Peter: *See*—
Muller, Hanns P.; Hettel, Hans; Wagner, Kuno; and Vogtel, Peter, 4,546,116, Cl. 521-106.000.

Voitov, Vladimir G.: *See*—
Stepanenko, Alexandr V.; Voitov, Vladimir G.; Klimenkov, Stepan S.; Bartashevich, Svyatoslav A.; and Karpitsky, Viktor S., 4,545,229, Cl. 72-73.000.

Volk, Andrew; and McAfee, Christopher, to Intel Corporation. Method and means for testing integrated circuits. 4,546,472, Cl. 371-15.000.

Volkart, Peter: *See*—
Vischer, Daniel; and Volkart, Peter, 4,545,403, Cl. 137-497.000.

Vongeheur, Hermann-Otto, to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG. Method for pouring confectionery solution. 4,546,005, Cl. 426-660.000.

von Pragenau, George L., to United States of America, National Aeronautics and Space Administration. Damping seal for turbomachinery. 4,545,586, Cl. 277-53.000.

Vora, Madhukar B., to Fairchild Camera & Instrument Corporation. Process for fabricating a lateral transistor having self-aligned base and base contact. 4,545,113, Cl. 29-578.000.

Vos, Jan: *See*—
Maijers, Andries C.; and Vos, Jan, 4,546,209, Cl. 174-52.0PE.

Vyskummy ustav chemickych claken: *See*—
Knotek, Lubomir; Peciar, Jozef; Mitterpach, Ivan; Hudak, Jozef; Simo, Jan; Badura, Jan; Beseda, Viliam; Mihaly, Frantisek; Gregor, Alexander; and Klisky, Jan, 4,546,040, Cl. 428-370.000.

W. L. Gore & Associates, Inc.: *See*—
Gore, Wilbert L.; Gore, Robert W.; and Gore, David W., 4,545,862, Cl. 203-10.000.

W. R. Grace & Co.: *See*—
Bryant, George E., 4,545,103, Cl. 29-432.000.

W. R. Grace & Co., Cryovac Div.: *See*—
Day, Timothy T., 4,545,177, Cl. 53-434.000.

Wada, Akira: *See*—
Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, 4,546,222, Cl. 200-144.00B.

Wada, Masaru: *See*—
Shimizu, Hirokazu; Itoh, Kunio; Sugino, Takashi; and Wada, Masaru, 4,546,478, Cl. 372-36.000.

Wada, Yoshimi: *See*—
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Wagner, Kuno: *See*—
Muller, Hanns P.; Hettel, Hans; Wagner, Kuno; and Vogtel, Peter, 4,546,116, Cl. 521-106.000.

Waide, William M., to BCDS Corporation. Engine with roller and cam drive from piston to output shaft. 4,545,336, Cl. 123-55.0AA.

Wajima, Motoyo: *See*—
Takahashi, Akio; Shimazaki, Takeshi; Wajima, Motoyo; and Morishita, Hirosada, 4,546,168, Cl. 528-107.000.

Wakabayashi, Hiroshi, to Nippon Kogaku K.K. Light emission blocking device of a camera capable of effecting flashlight photography. 4,545,666, Cl. 354-412.000.

Waldman, Fred. Hard contact lens suction cups and method for their production. 4,545,478, Cl. 206-5.100.

Walewski, Leonard M., to United States Steel Corporation. Inhibiting styrene emissions in unsaturated polyester resins. 4,546,142, Cl. 524-487.000.

Walker, David G. Cuprous aluminum cyano trichloride: $CuAl(CN)Cl_3$: its preparation and use for the reversible complexing of unsaturated ligands. 4,545,966, Cl. 423-245.000.

Walker, Harold R.: *See*—
McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, 4,546,382, Cl. 358-84.000.

Wallace, Richard B., to Oakland Corporation, The. Thread lock. 4,545,712, Cl. 411-258.000.

Wallat, Siegfried: *See*—
Moller, Hinrich; Wallat, Siegfried; and Bartnik, Friedhelm, 4,545,984, Cl. 424-70.000.

Walling, Joerg-Heim J.: *See*—
Porter, John F.; Walling, Joerg-Heim J.; and Axiuk, Oleg, 4,545,858, Cl. 162-267.000.

Walser, Armin: *See*—
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, 4,546,183, Cl. 544-330.000.

Walsh, J. William. Apparatus for electrophoretic recovery of nucleic acids and other substances. 4,545,888, Cl. 204-301.000.

Walsh, Michael M.: *See*—
Corey, John A.; and Walsh, Michael M., 4,545,341, Cl. 123-192.00B.

Walton, Charles A. Electronic proximity identification system. 4,546,241, Cl. 235-380.000.

Walton, Francis R., to Thomas Willett & Co. Ltd. Apparatus for automatically processing slurry. 4,545,736, Cl. 417-63.000.

Walton, Riley C.: *See*—
Carr, Dennis D.; and Walton, Riley C., 4,546,054, Cl. 429-101.000.

Wambaugh, John O., to Schlumberger Technology Corporation. Reinforcing element and demand sensitive pressure intensifier for sealing a well casing. 4,545,433, Cl. 166-105.000.

Wan, Jeffrey K. S.; and Kriz, Jaroslav F., to Canada, Her Majesty the Queen in right of, as represented by the Minister of Natural Resources. Hydrodesulphurization of hydrocracked pitch. 4,545,879, Cl. 204-158.00R.

Wang, Chin-Chung. Composite wooden horse cart with forward and backward controls. 4,545,590, Cl. 280-1.175.

Wardill, Gordon A., to Ford Motor Company. Energy absorbing structure. 4,545,172, Cl. 52-795.000.

Warn Industries, Inc.: *See*—
Telford, Thomas M.; and Haase, James W., 4,545,567, Cl. 254-344.000.

Warner, Bert J.; and Warner, Joe F. Method and apparatus for forming a heat exchange system in the earth. 4,545,442, Cl. 175-220.000.

Warner, Joe F.: *See*—
Warner, Bert J.; and Warner, Joe F., 4,545,442, Cl. 175-220.000.

Warner-Lambert Company: *See*—
Ambike, Suhas H.; Grewal, Narinder S.; and Blaser, Eric, 4,545,979, Cl. 424-52.000.
Becker, Amy J.; Abbazia, Leonard P.; and Medri, Mario W., 4,545,989, Cl. 424-154.000.
Vaughan, Thomas L., 4,545,783, Cl. 604-259.000.

Warner, Richard C.: *See*—
Laughon, Thomas C.; Haynes, H. Taylor; Klopach, Robert T.; and Warner, Richard C., 4,546,357, Cl. 343-702.000.

Washbourn, Jack; and Cogan, Howard F., to Westinghouse Brake & Signal. Electric actuators. 4,546,296, Cl. 318-372.000.

Washbourn, Jack; and Cogan, Howard F., to Westinghouse Brake & Signal. Electric actuators. 4,546,297, Cl. 318-372.000.

Washbourn, Jack: *See*—
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., 4,546,295, Cl. 318-372.000.
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., 4,546,298, Cl. 318-372.000.

Watanabe, Hiroyuki; Osaka, Kuniaki; and Tanaka, Yasushi, to Toyota Jidosha Kabushiki Kaisha. Vehicle body structure for a longitudinally extending floor tank and a gear shift mechanism. 4,545,589, Cl. 280-5.00A.

Watanabe, Keiichiro: *See*—
Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, 4,546,081, Cl. 435-161.000.

Watanabe, Minoru: *See*—
Inokawa, Michio; Watanabe, Minoru; Miyasaka, Yoshiteru; and Watanabe, Toshio, 4,545,292, Cl. 98-42.210.

Watanabe, Ryuji; Wada, Akira; Ando, Hisashi; Shimizu, Seiki; Kurosawa, Yukio; and Iwashita, Kiyoji, to Hitachi, Ltd. Vacuum switch and method of manufacturing the same. 4,546,222, Cl. 200-144.00B.

Watanabe, Shinichiro, to Japan Spectroscopic Co., Ltd. Method and apparatus for controlling measurement in a spectrophotometer. 4,545,681, Cl. 356-325.000.

Watanabe, Shuichi: *See*—
Itoh, Michio; Tsukamoto, Takehiro; Watanabe, Shuichi; Kinoshita, Takeshi; and Tomita, Seisuke, 4,545,416, Cl. 152-539.000.

Watanabe, Toshio: *See*—
Inokawa, Michio; Watanabe, Minoru; Miyasaka, Yoshiteru; and Watanabe, Toshio, 4,545,292, Cl. 98-42.210.

Watson, Robert E.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.
Watt, Bryan K.: *See—*
Peyton, John J.; and Watt, Bryan K., 4,546,247, Cl. 250-223.00B.
Watts, David J., to Safety Light Corporation. Self-luminous light source. 4,546,417, Cl. 362-84.000.
Wave, Larry E.; and Woods, Richard S., to Sanity Saver Cap Company. Sewer line backup detection, alarm and detention apparatus. 4,546,346, Cl. 340-608.000.
Wayman, William H.: *See—*
Hays, Dan A.; and Wayman, William H., 4,545,669, Cl. 355-3.00R.
Weaver, Charles S.; LeBlanc, Robert A.; and Sweeney, Lawrence E., Jr., to Digital Recording Research Limited Partnership. Data compression method and apparatus. 4,546,342, Cl. 340-347.0DD.
Webb, Derrel D.; and Anderson, Edwin A. Jar mechanism energizer. 4,545,444, Cl. 175-296.000.
Weber, Edward V.: *See—*
Simpson, Robert A.; Trotter, Ralph R.; and Weber, Edward V., 4,546,260, Cl. 250-491.100.
Weber, Jorg: *See—*
Christmann, Burkhard; Weber, Jorg; and Stadtfeld, Gerhard, 4,545,420, Cl. 164-150.000.
Weber, Peter: *See—*
Hetz, Walter; and Weber, Peter, 4,545,386, Cl. 128-660.000.
Weber, Wolfram; Neumann, Hans-Jurgen; Meisberger, Artur; and Mathieu, Bernd, to Fresenius AG. Peristaltically operating roller pump. 4,545,744, Cl. 417-475.000.
Webers, Werner: *See—*
Neier, Wilhelm; Webers, Werner; and Dettmer, Michael, 4,546,206, Cl. 568-697.000.
Wehnert, George J.; and Richter, Stanley J., to United Technologies Corporation. Molded-in composite bushings. 4,545,837, Cl. 156-191.000.
Weil, Joachim; and Sattelmeyer, Richard, to Hoechst Aktiengesellschaft. Rubber vulcanisates, having a Shore A hardness of below 65° . 4,546,143, Cl. 524-511.000.
Weingarten, Franz: *See—*
Backe, Wolfgang; Weingarten, Franz; and Murrenhoff, Hubertus, 4,545,201, Cl. 60-420.000.
Weir, Donald R.; Masters, Ian M.; Doyle, Barry N.; and Chalkley, Michael E., to Sherritt Gordon Mines Limited. Process for separately recovering zinc and lead values from zinc and lead containing sulphidic ore. 4,545,963, Cl. 423-26.000.
Weirauch, Donald F.: *See—*
Spinelli, Thomas S.; Manns, William G.; and Weirauch, Donald F., 4,546,406, Cl. 361-386.000.
Weiss, Joseph F. Visual examination apparatus. 4,545,658, Cl. 351-222.000.
Weisser, Hans-Joerg: *See—*
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Welch Allyn, Inc.: *See—*
Sarofeen, Joseph J.; and Fischer, David M., 4,546,379, Cl. 358-42.000.
Welch, Stephen R. Storage rack. 4,545,489, Cl. 211-11.000.
Welles, Stanley W. Airframe design. 4,545,552, Cl. 244-90.00R.
Wells, Roger, to Weyerhaeuser Company. Louvered steam box for controlling moisture profile of a fibrous web. 4,545,857, Cl. 162-252.000.
Welsh, Russell J.: *See—*
McKenna, William J.; Silvers, Kenneth W.; Nickerson, Rand B.; Welsh, Russell J.; Walker, Harold R.; Cullity, Joseph A.; and Stryzak, Bohdan, 4,546,382, Cl. 358-84.000.
Welsh, Thomas M. Kinetic back support belt. 4,545,370, Cl. 128-78.000.
Wendt, David L.: *See—*
Kearsley, Walter H.; and Wendt, David L., 4,545,357, Cl. 123-556.000.
Wenger, Jean: *See—*
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,545,807, Cl. 71-92.000.
Wenninger, Freddie W.: *See—*
Spangler, Richard M.; Burmeister, Eugene V.; Cada, Frank E.; Christopher, Chris J.; Covington, Wayne F.; Judd, Myles A.; Wenninger, Freddie W.; Watson, Robert E.; and Simcoe, Kent W., 4,546,448, Cl. 364-900.000.
Wenz, Friedrich: *See—*
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West Electric Company, Ltd.: *See—*
Niwa, Katsuhisa; and Ikeda, Takahiro, 4,545,667, Cl. 354-419.000.
Westinghouse Brake & Signal: *See—*
Washbourn, Jack; and Cogan, Howard F., 4,546,296, Cl. 318-372.000.
Washbourn, Jack; and Cogan, Howard F., 4,546,297, Cl. 318-372.000.
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., 4,546,295, Cl. 318-372.000.
Westinghouse Brake & Signal Co.: *See—*
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., 4,546,298, Cl. 318-372.000.
Westinghouse Electric Corp.: *See—*
Cutkosky, Mark R.; and Kurokawa, Eiki, 4,545,722, Cl. 414-730.000.
Hammer, Joel B.; and Gronholm, Richard A., 4,546,279, Cl. 310-59.000.
Westvaco Corporation: *See—*
Dilling, Peter, 4,546,173, Cl. 530-501.000.
Wetzel Enterprises, Inc.: *See—*
Wetzel, Otto K., Jr., 4,545,365, Cl. 126-433.000.
Wetzel, Otto K., Jr., to Wetzel Enterprises, Inc. Fluid heating system utilizing solar energy and waste heat. 4,545,365, Cl. 126-433.000.
Weyer, Paul P. Adjustable rotary actuator. 4,545,289, Cl. 92-13.600.
Weyerhaeuser Company: *See—*
Wells, Roger, 4,545,857, Cl. 162-252.000.
Weyland, Horst: *See—*
Metzger, Karl G.; Pfitzner, Jorg; Schmidt, Delf; Weyland, Horst; Benz, Gunter; and Schroder, Theo, 4,546,079, Cl. 435-71.000.
Whalen, Brian L. Infinitely variable tandem transmission. 4,545,204, Cl. 60-491.000.
Wheeler, David C.; and Blakeway, Douglas H., to Wheeler Industries, Ltd. Air cooled light fixture with baffled flow through a filter array. 4,546,420, Cl. 362-268.000.
Wheeler Industries, Ltd.: *See—*
Wheeler, David C.; and Blakeway, Douglas H., 4,546,420, Cl. 362-268.000.
Whipple, David P.: *See—*
DaSilva, Marcus K.; Whipple, David P.; and Temple, Robert E., 4,546,331, Cl. 332-19.000.
Whirlpool Corporation: *See—*
Bozoarth, David B.; and Rickel, William R., 4,545,947, Cl. 264-150.000.
Whisnant, Hubert E. Display framing apparatus. 4,545,142, Cl. 40-605.000.
White Consolidated Industries, Inc.: *See—*
Earley, Robert W., 4,545,743, Cl. 417-372.000.
White, Robert N.: *See—*
Uffner, William E.; and White, Robert N., 4,545,699, Cl. 404-31.000.
Whitehouse, Harper J.; and McKnight, William H., to United States of America, Navy. High speed optically controlled sampling system. 4,546,249, Cl. 250-227.000.
Whitmore, Martyn W.; Pollard, Michael D.; and Smythe, Stephen R., to FBC Limited. Process for the preparation of aliphatic azo compounds using an amine coupling. 4,546,174, Cl. 534-838.000.
Whittaker Corporation: *See—*
McGeary, Peter G., 4,545,633, Cl. 339-42.000.
Wickenden, Dennis K.: *See—*
Todd, Anthony G.; and Wickenden, Dennis K., 4,546,373, Cl. 357-67.000.
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., to Westinghouse Brake & Signal. Electric actuators. 4,546,295, Cl. 318-372.000.
Wickham, David J.; Washbourn, Jack; and Cogan, Howard F., to Westinghouse Brake & Signal Co. Electric actuators. 4,546,298, Cl. 318-372.000.
Widmayer, Don F. Control of AC power to inductive loads. 4,546,308, Cl. 323-319.000.
Wiegers, Wilhelmus J.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Process for preparing phenyl alkanols and perfumery uses of resulting products. 4,546,208, Cl. 568-814.000.
Wieland, Gunter: *See—*
Rothfuss, Hans; Wieland, Gunter; and Schreiter, Peter, 4,545,568, Cl. 266-280.000.
Wier, Franz, to REPA Feinstanzwerk GmbH. Lock for a safety belt. 4,545,097, Cl. 24-642.000.
Wierzba, Robert B.; Snyder, Robert G.; and Kleefisch, Blaise H., to Nalco Chemical Company. Method and apparatus for reducing boiler sootblowing requirements. 4,545,411, Cl. 141-91.000.
Wiesehahn, Gary P.: *See—*
Giles, Richard E.; Stevens, David R.; and Wiesehahn, Gary P., 4,545,987, Cl. 424-89.000.
Wilde, Sheldon L.; and McCandless, Thomas J., to H-C Industries, Inc. Plastic closure with mechanical pilfer band. 4,545,496, Cl. 215-252.000.
Willamette Industries, Inc.: *See—*
Carl, Charles L.; Gale, Ronald S.; and Forstrom, William J., 4,545,781, Cl. 493-220.000.
Williams, David A., to Aervoe-Pacific Company, Inc. Wheeled spraying device. 4,545,531, Cl. 239-150.000.
Williams, Errol R., Jr., to Rolm Corporation. Power supply for CRT terminal. 4,546,388, Cl. 358-190.000.
Williams, Richard B. Combined gate and lock assembly. 4,545,150, Cl. 49-366.000.
Williamson, Kirk E. Drill bits with polycrystalline diamond cutting elements mounted on serrated supports pressed in drill head. 4,545,441, Cl. 175-329.000.
Williamson, Paul J. Golf practice aid. 4,545,581, Cl. 273-187.00A.
Willingham, Mark C.: *See—*
Pastan, Ira; Willingham, Mark C.; and Fitzgerald, David J., 4,545,985, Cl. 424-85.000.
Wilmot, Ian R.: *See—*
Cribb, B. Jay, Jr.; Drozd, Edward J., Jr.; Wilmot, Ian R.; and Leap, Debradell C., 4,545,508, Cl. 222-153.000.
Wilson, Kenneth E.: *See—*
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D.; Flor, James E.; and Deriso, Cheryl, 4,545,991, Cl. 514-100.000.

Wilson, Lance K., to Deere & Company. Method for detecting the presence of a chromate coating on aluminum. 4,546,087, Cl. 436-5.000.

Wilson, Louis D.; and Jones, Patrick, to Drive Line Service, Inc. Balance work support and chuck. 4,545,247, Cl. 73-473.000.

Winkler & Dunnebier Maschinenfabrik und Eisengiesserei GmbH & Co. KG: *See*—
Vongeheur, Hermann-Otto, 4,546,005, Cl. 426-660.000.

Winklmann, Erwin: *See*—
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Winston, Jeffery M. Graphic staging device. 4,545,140, Cl. 40-10.00D.

Winternitz, Paul: *See*—
Frater, Georg; Suchy, Milos; Wenger, Jean; and Winternitz, Paul, 4,545,807, Cl. 71-92.000.

Wiredal, Harry A. I., to Sandvik Aktiebolag. Means for drilling. 4,545,443, Cl. 175-258.000.

Wirtz Manufacturing Company, Inc.: *See*—
McLane, Jack E.; and Schenk, Raymond L., 4,545,422, Cl. 164-429.000.

Wise, Lawrence. Manual remote sound control for TV and radio and high fidelity. 4,546,335, Cl. 334-8.000.

Wittler, Fritz; and Fraikin, Michael, to Zimmermann & Jansen GmbH. Machine for charging a glass melting tank furnace. 4,545,717, Cl. 414-166.000.

Wittmann, Otto: *See*—
Horacek, Heinrich; Wittmann, Otto; Marx, Matthias; and Mayer, Johann, 4,546,039, Cl. 428-357.000.

Wohl, Ronald A.: *See*—
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Wohr, Rolf: *See*—
Maier, Gernot; Tischler, Heinrich; Wohr, Rolf; and Schwarzhoff, Wolfgang, 4,545,632, Cl. 339-18.00R.

Wolf, Joost M.; Post, Hendrik A.; Stigter, Willem H.; van der Brug, Gerard J.; and Sieben, Joannes H. F. C. Tape reel mounting and coupling for a magnetic-tape cassette. 4,545,550, Cl. 242-200.000.

Wolfram, Norman E., to Northeast Pyreduction Corp. High temperature furnace. 4,545,306, Cl. 110-247.000.

Wolfrum, Emil, to Gebrauchs Gerate GmbH. Method of and apparatus for making an adhesive-coated roll. 4,546,011, Cl. 427-179.000.

Won, Kwang J.; and Pecoraro, George A., to PPG Industries, Inc. Submerged oxygen-hydrogen combustion melting of glass. 4,545,800, Cl. 65-134.000.

Wong, Carl Y.; Khan, Mir N.; and Mihalik, John A., to Hershey Foods Corporation. Process of manufacturing candy bars containing wafers and wafer bars manufactured thereby. 4,545,997, Cl. 426-94.000.

Wood, Edgar A., to Union Carbide Corporation. Metering device. 4,545,513, Cl. 222-632.000.

Wood, John C.: *See*—
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Woodbrey, James C.; Moncur, Marlowe V.; and Hedrick, Ross M., to Monsanto Company. Compositions of nylon and elastomers. 4,546,147, Cl. 525-183.000.

Woodbury, Richard P.: *See*—
Valdiserri, Leo L.; and Woodbury, Richard P., 4,546,180, Cl. 544-214.000.

Woodhead Industries, Inc.: *See*—
Baggio, Horacio; Eckart, George R.; and DeBeradinis, Louis A., 4,546,418, Cl. 362-85.000.

Woods, Richard S.: *See*—
Wave, Larry E.; and Woods, Richard S., 4,546,346, Cl. 340-608.000.

Woods, Ross A.: *See*—
Bateman, Neil E.; and Woods, Ross A., 4,546,197, Cl. 560-66.000.

Woodworth, Chester L.: *See*—
Fabel, David A.; Hoagland, John C.; and Woodworth, Chester L., 4,545,504, Cl. 222-55.000.

Wright, Douglas C., to Mineral Deposits Ltd. Spiral separators. 4,545,900, Cl. 209-459.000.

Wright, Larry G.: *See*—
Griffiths, David H.; and Wright, Larry G., 4,546,485, Cl. 373-28.000.

Wu, Pai-Chuan: *See*—
Cancio, Leopoldo V.; and Wu, Pai-Chuan, 4,546,029, Cl. 428-141.000.

Wuertele, Frederick S.: *See*—
Paul, Kermit D.; Addams, Charles F., Jr.; and Wuertele, Frederick S., 4,545,410, Cl. 141-18.000.

Wuerzer, Bruno: *See*—
Jahn, Dieter; Becker, Rainer; Keil, Michael; Spiegler, Wolfgang; and Wuerzer, Bruno, 4,545,806, Cl. 71-88.000.

Wusirika, Raja R., to Corning Glass Works. Group 4b boride and VB_2/YB_2. 4,546,089, Cl. 501-96.000.

Wust, Willi: *See*—
Diekötter, Friedrich W.; Honges, Edgar; Just, Gunther; Smolka, Heinz-Gerd; and Wust, Willi, 4,545,969, Cl. 423-328.000.

Xerox Corporation: *See*—
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,546,480, Cl. 372-45.000.
Fischbeck, Kenneth H.; Creagh, Linda T.; and Raschke, Curt R., 4,546,360, Cl. 346-1.100.
Hays, Dan A.; and Wayman, William H., 4,545,669, Cl. 355-3.00R.
Huggins, Raymond W., 4,546,262, Cl. 250-551.000.
Ong, Beng S.; and Murti, Dasarao K., 4,546,059, Cl. 430-59.000.

Xuan, Mai T., to Omega SA. Winding for subjecting the rotor of a stepping motor to two magnetic fields symmetric to two perpendicular axes by energization of one winding. 4,546,278, Cl. 310-49.00R.

Yacavonis, Robert A.: *See*—
Hultmark, Eric B.; Metreaud, Claude G.; and Yacavonis, Robert A., 4,546,405, Cl. 361-386.000.

Yagi, Haruhiko: *See*—
Ninomiya, Yuki; and Yagi, Haruhiko, 4,545,694, Cl. 400-124.000.

Yagii, Koji: *See*—
Miyata, Jun; Yagii, Koji; and Shimizu, Tsutomu, 4,545,825, Cl. 148-3.000.

Yakurigaku Chuo Kenkyusho: *See*—
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Yamada, Susumu: *See*—
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Yamada, Tomiaki; Sazanami, Tsuneo; Watanabe, Keiichiro; Iida, Takamitsu; Hasegawa, Eiichi; and Sakamoto, Masahiro, to JGC Corporation; and Kansai Paint Co., Ltd. Continuous alcohol fermentation process using immobilized yeast. 4,546,081, Cl. 435-161.000.

Yamagata, Seiichi: *See*—
Sakai, Masaaki; Sato, Kenji; and Yamagata, Seiichi, 4,546,020, Cl. 428-16.000.

Yamagishi, Shigeru: *See*—
Hiroyasu, Minoru; Yamagishi, Shigeru; Yamashita, Hideo; Yamada, Susumu; and Takahashi, Koji, 4,545,706, Cl. 408-1.0BD.

Yamaguchi, Ikutoshi; and Kajigaya, Shinichi, to Bridgestone Tire Company Limited. Marine fenders. 4,545,316, Cl. 114-219.000.

Yamaguchi, Nobutaka; Fujiyama, Masaaki; Ryoke, Katsumi; and Tadokoro, Eiichi, to Fuji Photo Film Company, Limited. Magnetic recording medium. 4,546,038, Cl. 428-323.000.

Yamaguchi, Sadatsu: *See*—
Nakagawa, Tsuneo; Yamaguchi, Sadatsu; Amano, Toshihiko; and Asano, Kohzoh, 4,546,157, Cl. 526-247.000.

Yamaguchi, Tokundo; Kimizuka, Masanori; and Kawashima, Isao, to Sony Corporation. Magnetic tape cassette. 4,545,500, Cl. 220-4.00B.

Yamaguchi, Yuki: *See*—
Seki, Nansho; Yamaguchi, Yuki; Nakamura, Yukihiro; Kubo, Hiroshi; and Tsuruya, Tetsuo, 4,545,809, Cl. 71-92.000.

Yamaguti, Terushige; Miki, Toshinori; Mannaka, Toshio; Koyama, Hiroshi; and Kawano, Yukihiro, to Hitachi, Ltd.; and Nisshin Steel Co., Ltd. Roll eccentricity control system for a rolling apparatus. 4,545,228, Cl. 72-16.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Nakahama, Ryoji; and Handa, Kenichi, 4,545,769, Cl. 440-61.000.
Suzuki, Tomonori; and Toyohara, Makoto, 4,545,332, Cl. 123-41.010.

Yamamoto, Hideo: *See*—
Matsumoto, Shuichi; Hatori, Yoshinori; Murakami, Hitomi; and Yamamoto, Hideo, 4,546,386, Cl. 358-136.000.

Yamamoto, Hiroyoshi: *See*—
Inoue, Shigeyasu; and Yamamoto, Hiroyoshi, 4,545,818, Cl. 106-22.000.

Yamamoto, Saburo; Hayashi, Hiroshi; and Yano, Seiki, to Sharp Kabushiki Kaisha. Window structure semiconductor laser. 4,546,481, Cl. 372-48.000.

Yamamoto, Sakuei: *See*—
Nishida, Mitsuhiro; Yamamoto, Sakuei; Sonoda, Nobuo; Okahashi, Kazuo; and Takagi, Shoji, 4,546,130, Cl. 523-459.000.

Yamamoto, Sumio, to Nippon Electric Co., Ltd. Monitor for transmission line. 4,546,467, Cl. 370-13.000.

Yamamoto, Takaaki, to Sansui Electric Co., Ltd. Signal reconstruction circuit for digital signals. 4,546,394, Cl. 360-53.000.

Yamamoto, Tsutomu: *See*—
Tsuchimoto, Yasushi; Takahata, Shiro; Shimada, Kiyotaka; Tanaka, Koji; Aoki, Susumu; Yamamoto, Tsutomu; Ashizawa, Masaaki; and Nishimoto, Kazuo, 4,546,033, Cl. 428-290.000.

Yamamuro, Kiyohiko: *See*—
Kamei, Sadao; Ohashi, Yuichi; Ukai, Toshinao; Yamamuro, Kiyohiko; and Takei, Haruo, 4,546,074, Cl. 430-573.000.

Yamamuro, Sigeaki: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,545,265, Cl. 74-868.000.

Yamanaka, Hideaki: *See*—
Takaya, Takao; Takasugi, Hisashi; Yamanaka, Hideaki; Miyai, Kenji; and Inoue, Yoshikazu, 4,546,101, Cl. 514-253.000.

Yamanaka, Teruo: *See*—
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Yamanari, Kenzo, to Nippon Electric Co., Ltd. Charge transfer device having a precisely controlled injection rate. 4,546,368, Cl. 357-24.000.

Yamaoka, Nobutatsu: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,545,929, Cl. 252-520.000.

Yamashita, Hideo: *See*—
Hiroyasu, Minoru; Yamagishi, Shigeru; Yamashita, Hideo; Yamada, Susumu; and Takahashi, Koji, 4,545,706, Cl. 408-1.0BD.

Yamauchi, Hiroshi, to Shimadzu Corporation. Charged particle energy analyzer. 4,546,254, Cl. 250-305.000.

Yang, Elmer C., to Pacific Scientific Company. Constant drag device. 4,545,322, Cl. 188-67.000.

Yang, Lien C. Method of rubblization for in-situ oil shale processing. 4,545,622, Cl. 299-2.000.

Yanmar Diesel Engine Co., Ltd.: *See*—
Yogome, Yoshihiro; Kobashi, Yuuji; and Shinada, Kazuyoshi, 4,545,469, Cl. 192-51.000.

Yano, Mitsuhiro: *See*—
Ishikawa, Hiroshi; and Yano, Mitsuhiro, 4,546,479, Cl. 372-45.000.
Yano, Seiki: *See*—
Yamamoto, Saburo; Hayashi, Hiroshi; and Yano, Seiki, 4,546,481, Cl. 372-48.000.
Yasuda, Hiroshi: *See*—
Nagano, Mitsuo; Hirai, Koichi; Kitamura, Kouichi; Shinkai, Kenkichi; and Yasuda, Hiroshi, 4,545,942, Cl. 260-465.00D.
Yasuda, Yoshichiro; and Satoh, Seio, to Ebara Corporation. Ultrasonic flow meter. 4,545,244, Cl. 73-195.000.
Yasui, Kazuomi: *See*—
Aya, Masahiro; Saito, Junichi; Yasui, Kazuomi; Shiokawa, Kozo; Morishima, Norihisa; and Goto, Toshio, 4,545,944, Cl. 260-545.00R.
Yasukawa, Kazuyoshi: *See*—
Oguchi, Yukio; and Yasukawa, Kazuyoshi, 4,546,443, Cl. 364-513.000.
Yasuoka, Hirotoshi, to Mitsubishi Denki Kabushiki Kaisha. Robot arm having bearing support. 4,546,233, Cl. 219-125.100.
Yatabe, Hiroyuki: *See*—
Nakamura, Mitsugu; Yoshizu, Satoru; Sakata, Teiichi; and Yatabe, Hiroyuki, 4,545,627, Cl. 384-585.000.
Yates, Larry A. Process for recycling bituminous asphalt pavement. 4,545,700, Cl. 404-75.000.
Yeager, Howard L.; and Malinsky, J. David, to Olin Corporation. Automated membrane test cell apparatus and method for so using. 4,545,863, Cl. 204-1.00T.
Yee, Edmund L.: *See*—
Ovshinsky, Stanford R.; Sapru, Krishna; and Yee, Edmund L., 4,545,883, Cl. 204-192.0SP.
Yeznach, Anthony: *See*—
Simpson, Scott S.; Yeznach, Anthony; and Barton, Carlos L., 4,546,118, Cl. 521-130.000.
Yoda, Hiroaki: *See*—
Tomioka, Shunzoo; Nakano, Masaaki; Okano, Kinpei; Shimizu, Kousaku; and Yoda, Hiroaki, 4,545,741, Cl. 417-365.000.
Yogome, Yoshihiro; Kobashi, Yuuji; and Shinada, Kazuyoshi, to Yanmar Diesel Engine Co., Ltd. Cone clutch. 4,545,469, Cl. 192-51.000.
Yokomichi, Isao: *See*—
Nishiyama, Ryuzo; Fujikawa, Kanichi; Yokomichi, Isao; Haga, Takahiro; Nagatani, Kuniaki; and Hayashi, Kouji, 4,546,191, Cl. 546-303.000.
Yokota, Hiroshi: *See*—
Miyajiri, Tetsuo; Habasaki, Toshimi; Yokota, Hiroshi; Tsurita, Tamio; and Nakahara, Motohiro, 4,545,801, Cl. 65-157.000.
Yokota, Minoru: *See*—
Umemura, Mamoru; and Yokota, Minoru, 4,546,432, Cl. 364-200.000.
Yong Chul, Kim: *See*—
Hiroshi, Sakurai; and Yong Chul, Kim, 4,545,756, Cl. 425-590.000.
Yorita, Tadahiro: *See*—
Nishikawa, Toshio; Ishikawa, Youhei; and Yorita, Tadahiro, 4,546,334, Cl. 333-206.000.
Yoshida, Kenichi, to Nissan Motor Company, Limited. Gas turbine engine control system. 4,545,198, Cl. 60-39.250.
Yoshida Kogyo K. K.: *See*—
Fisher, Harry; and Fisher, Stuart, 4,545,118, Cl. 29-768.000.
Yoshida, Kozaburo: *See*—
Kobayashi, Waichi; Yoshida, Kozaburo; and Igarashi, Hideaki, 4,545,975, Cl. 423-636.000.
Yoshida, Noboru: *See*—
Ishizumi, Kikuo; Muramatsu, Michihisa; Sato, Hiromi; Tanno, Norihiko; and Yoshida, Noboru, 4,545,936, Cl. 260-377.000.
Yoshida, Ryo: *See*—
Konishi, Hiroyuki; Hino, Naganori; Matsumoto, Hiroshi; and Yoshida, Ryo, 4,545,812, Cl. 71-103.000.
Yoshida, Ryohei: *See*—
Kimura, Masahiro; Hayashi, Yoshitaka; and Yoshida, Ryohei, 4,545,537, Cl. 241-36.000.
Yoshida, Tatumasa: *See*—
Fukasawa, Atsushi; Hosoda, Kenichiro; Sato, Takuro; and Yoshida, Tatumasa, 4,546,333, Cl. 333-202.000.
Yoshida, Tomio: *See*—
Koishi, Kenji; Yoshida, Tomio; Satoh, Isao; and Ohara, Shunji, 4,546,462, Cl. 369-53.000.
Yoshimoto, Masato; and Ohwaki, Shinji, to Teijin Limited. Hollow irregular multifilament yarn and process and spinneret for producing the same. 4,546,043, Cl. 428-397.000.
Yoshimura, Shingo; Ito, Katsumi; and Tanaka, Shigeru, to Kubota, Ltd. Automatic running work vehicle. 4,545,453, Cl. 180-131.000.
Yoshinari, Masashi: *See*—
Niinomi, Masahiro; Okubo, Yukihiro; Igarashi, Yoshinori; and Yoshinari, Masashi, 4,546,166, Cl. 528-60.000.
Yoshinari, Yukihiro: *See*—
Kuroki, Yoichi; Yoshinari, Yukihiro; and Hiraga, Ryozo, 4,545,684, Cl. 356-400.000.
Yoshino, Souichi; Kusanagi, Tadashi; and Mori, Masakazu, to Mitsubishi Denki Kabushiki Kaisha. Device for cooling semiconductor elements. 4,546,409, Cl. 361-387.000.
Yoshino, Tooru: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Tsuboi, Yoshimasa, 4,545,758, Cl. 431-208.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Tahara, Tetsuya; Arita, Masafumi; and Kuroda, Tsuyoshi, 4,546,107, Cl. 514-411.000.
Yoshizu, Satoru: *See*—
Nakamura, Mitsugu; Yoshizu, Satoru; Sakata, Teiichi; and Yatabe, Hiroyuki, 4,545,627, Cl. 384-585.000.
Young, Christopher M.; and Cowen, Steven J., to United States of America, Navy. Retro-reflective alignment technique for fiber optical connectors. 4,545,643, Cl. 350-96.200.
Young, Niels O., to Helix Technology Corporation. Cryogenic refrigeration system with linear drive motors. 4,545,209, Cl. 62-6.000.
Young, Niels O., to Helix Technology Corporation. Linear motor compressor with clearance seals and gas bearings. 4,545,738, Cl. 417-53.000.
Young, Russel L.: *See*—
Schoen, Jerry W.; and Young, Russel L., 4,545,828, Cl. 148-111.000.
Young, Thomas B. Railroad grade crossing. 4,545,527, Cl. 238-8.000.
Yuasa, Miyabi: *See*—
Arita, Yosihumi; Murakami, Yukihiro; and Yuasa, Miyabi, 4,545,762, Cl. 432-59.000.
Yulkowski, Leon. Door construction. 4,545,607, Cl. 292-216.000.
Yumikura, Tsuneo: *See*—
Nakao, Kazushige; Ikeuchi, Masaki; Ozaki, Eiichi; and Yumikura, Tsuneo, 4,545,217, Cl. 62-476.000.
Yumoto, Hideaki, to TLV Co., Ltd. Float valve assembly. 4,545,397, Cl. 137-192.000.
Zaitsu, Hirohachi, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,545,668, Cl. 355-3.00R.
Zajicek, Ernst: *See*—
Lugscheider, Walter; Leutgob, Alois; Riegler, Ernst; Zajicek, Ernst; and Puhringer, Othmar, 4,546,483, Cl. 373-24.000.
Zampini, William A. Offset electrical outlet. 4,545,631, Cl. 339-14.00R.
Zandveld, Paul: *See*—
Nieveen van Dijkum, Adalbertus H. J.; Thuis, Robbert C.; and Zandveld, Paul, 4,546,371, Cl. 357-51.000.
Zane, Michael S., to KBL Corporation. Bicycle lock. 4,545,224, Cl. 70-39.000.
Zanno, Paul R.; Barnett, Ronald E.; and Riemer, Jed A., to General Foods Corporation. 3-Hydroxy-4-alkyloxyphenyl aliphatic carbonates. 4,546,000, Cl. 426-548.000.
Zanno, Paul R.: *See*—
Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., 4,545,999, Cl. 426-548.000.
Zaterka, Theodore R., to Combustion Engineering, Inc. Apparatus for regulating airflow to a chemical recovery boiler. 4,545,308, Cl. 110-297.000.
Zecher, Wilfried; Dhein, Rolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Process for the production of polyamide imides by using a phenol in the workup of the material. 4,546,138, Cl. 524-326.000.
Zecher, Wilfried; Dunwald, Willi; Merten, Rudolf; and Reinking, Klaus, to Bayer Aktiengesellschaft. Polyamidoimides prepared from trimelitic acid anhydride, isocyanates and either lactams or polyamides using a mixture of diisocyanatodiphenylmethane and tolylene diisocyanates. 4,546,162, Cl. 528-67.000.
Zelczer, Alex. Zone control apparatus for central heating and/or cooling systems. 4,545,524, Cl. 236-46.00R.
Zen, Enrico: *See*—
Piccolo, Oreste; Villa, Giovanni; and Zen, Enrico, 4,546,201, Cl. 562-401.000.
Zendle, Robert, to United States of America, Energy. Thermoluminescence dosimeter. 4,546,259, Cl. 250-484.100.
Zenick, Richard J.: *See*—
Zenick, Walter N.; and Zenick, Richard J., 4,546,266, Cl. 307-10.0AT.
Zenick, Walter N.; and Zenick, Richard J. Magnetically actuated interlock. 4,546,266, Cl. 307-10.0AT.
Zerand Corporation: *See*—
Bergland, Paul W., 4,545,518, Cl. 226-139.000.
Ziemianski, John P.: *See*—
McCunn, Thomas H.; and Ziemianski, John P., 4,545,826, Cl. 148-12.00E.
Zimmerman, Sheldon B.; Wilson, Kenneth E.; Monaghan, Richard L.; Del Val, Sagrario M.; Fernandez, Maria I. M.; Hensens, Otto D; Flor, James E.; and Deriso, Cheryl, to Merck & Co., Inc. Difficidin and derivative antibacterials. 4,545,991, Cl. 514-100.000.
Zimmermann & Jansen GmbH: *See*—
Wittler, Fritz; and Fraikin, Michael, 4,545,717, Cl. 414-166.000.
Zodiac: *See*—
Ferronniere, Michel; and Cros, Yves, 4,545,319, Cl. 114-345.000.
Zsiros, Laszlo : *See*—
Toth, Lajos; Tolnay, Lajos; Kiss, Laszlo ; Sziklavaris, Istvan; Aranyosi, Miklos; Zsiros, Laszlo ; Kiss, Ferenc; and Kiss, Lajos, 4,545,815, Cl. 75-49.000.
Zulauf, Herbert, to Swiss Aluminium Ltd. Device for manufacturing wheels for vehicles. 4,545,419, Cl. 164-111.000.
Zydeck, Michael: *See*—
Bleckmann, Hans-Wilhelm; Loreck, Heinz; Fennel, Helmut; and Zydeck, Michael, 4,546,437, Cl. 364-426.000.
Zysman, Lawrence J.; and Greene, Malbone W., to Beckman Instruments, Inc. Temperature measurement probe for chemical reactions and method of use thereof. 4,545,690, Cl. 374-165.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF OCTOBER, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

B.C.S.I. Laboratories, Inc.: *See*—
Sagi, Zsigmond L., Re. 32,000, Cl. 128-736.000.

Hauni-Werke Korber & Co. KG.: *See*—
Wahle, Gunter, Re. 32,001, Cl. 414-416.000.

Lord Corporation: *See*—
Rebman, Jack, Re. 31,999, Cl. 33-185.00R.

Myers, William D. Posterior chamber lens implant. Re. 31,998, Cl. 3-13.000.

Rebman, Jack, to Lord Corporation. Adjustable link-type insertion compliance device. Re. 31,999, Cl. 33-185.00R.

Sagi, Zsigmond L., to B.C.S.I. Laboratories, Inc. Device for use in early detection of breast cancer. Re. 32,000, Cl. 128-736.000.

Wahle, Gunter, to Hauni-Werke Korber & Co. KG. Method and apparatus for feeding cigarettes or analogous articles to packing machines or the like. Re. 32,001, Cl. 414-416.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., to Waters Associates, Inc. Pumping apparatus. B1 3,855,129, 10-8-85, Cl. 210-198.200.

B. B. Robertson Co.: *See*—
Robertson, Berthal B.; and Robertson, Michael L., B1 4,300,523, Cl. 126-21.00A.

Branecky, Anthony J.; and Harris, David W., to Celanese Corporation. Formaldehyde production process. B1 4,198,351, 10-8-85, Cl. 568-473.000.

Brux, Robert A., to Seaco Industries. Vegetable banding apparatus. B1 4,401,020, 10-8-85, Cl. 100-6.000.

Celanese Corporation: *See*—
Branecky, Anthony J.; and Harris, David W., B1 4,198,351, Cl. 568-473.000.

Cooper, J. Carl. Electronic noise reducing apparatus and method. B1 4,305,091, 10-8-85, Cl. 358-36.000.

ens BIO LOGICALS Inc.: *See*—
Ogilvie, Kelvin K., B1 4,347,360, Cl. 544-276.000.

Fulger, Charles V.; and Schaller, Daryl R., to Kellogg Company. Method for treating dried fruits to improve softness retention characteristics. B1 3,952,112, 10-8-85, Cl. 426-321.000.

Harris, David W.: *See*—
Branecky, Anthony J.; and Harris, David W., B1 4,198,351, Cl. 568-473.000.

Hutchins, Burleigh M., Jr.: *See*—
Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., B1 3,855,129, Cl. 210-198.200.

Kellogg Company: *See*—
Fulger, Charles V.; and Schaller, Daryl R., B1 3,952,112, Cl. 426-321.000.

Kohaut, John E., to Raceway Components, Inc. Insert device for cables. B1 3,995,102, 10-8-85, Cl. 174-48.000.

Ogilvie, Kelvin K., to ens BIO LOGICALS Inc. Ring open nucleoside analogues. B1 4,347,360, 10-8-85, Cl. 544-276.000.

Raceway Components, Inc.: *See*—
Kohaut, John E., B1 3,995,102, Cl. 174-48.000.

Robertson, Berthal B.; and Robertson, Michael L., to B. B. Robertson Co. Barbecue oven. B1 4,300,523, 10-8-85, Cl. 126-21.00A.

Robertson, Michael L.: *See*—
Robertson, Berthal B.; and Robertson, Michael L., B1 4,300,523, Cl. 126-21.00A.

Schaller, Daryl R.: *See*—
Fulger, Charles V.; and Schaller, Daryl R., B1 3,952,112, Cl. 426-321.000.

Seaco Industries: *See*—
Brux, Robert A., B1 4,401,020, Cl. 100-6.000.

Waters Associates, Inc.: *See*—
Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., B1 3,855,129, Cl. 210-198.200.

Waters, James L.: *See*—
Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., B1 3,855,129, Cl. 210-198.200.

LIST OF DESIGN PATENTEES

Alcorn, Denys L. Fluorescent reflector fixture. 280,935, 10-8-85, Cl. D26-26.000.

Aldridge, R. Warren, Jr., to Spencer Wright Industries, Inc. Brake lathe. 280,905, 10-8-85, Cl. D15-130.000.

Allen, James H., to 'totes' incorporated. Toiletries kit bag. 280,864, 10-8-85, Cl. D3-39.000.

Allen, James H., to 'totes' incorporated. Hand & shoulder bag. 280,867, 10-8-85, Cl. D3-71.000.

Allibert S.A.: *See*—
Chabanet, Jean P., 280,876, Cl. D6-559.000.
Chabanet, Jean P., 280,877, Cl. D6-561.000.

American Tourister, Inc.: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,865, Cl. D3-48.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 280,866, Cl. D3-48.000.

Artsana S.p.A.: *See*—
Catelli, Pietro, 280,915, Cl. D21-64.000.

Asaji, Toshio: *See*—
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, 280,900, Cl. D14-111.000.

AT&T Bell Laboratories: *See*—
Campbell, John S.; Engstrom, John G.; McGarvey, John N.; and Zambelli, Michael P., 280,896, Cl. D14-95.000.

Barber, Jack: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,865, Cl. D3-48.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 280,866, Cl. D3-48.000.

Barbula, Larance E. Cutting attachment for a weed trimmer. 280,903, 10-8-85, Cl. D15-16.000.

Batchelor, Clement W.: *See*—
Cake, Marcus P.; Falter, Harry W.; Batchelor, Clement W.; and Guarini, Michael A., 280,926, Cl. D23-127.000.

Bell, Max: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 280,866, Cl. D3-48.000.

Belsky, Jerome; and Belsky, Michael. Vehicle bumper. 280,891, 10-8-85, Cl. D12-169.000.

Belsky, Michael: *See—*
Belsky, Jerome; and Belsky, Michael, 280,891, Cl. D12-169.000.

Benigni, Paul E.; Costello, John C.; Gregory, Jack G.; and Morgan, Stuart K. Housing for control processing systems or similar article. 280,898, 10-8-85, Cl. D14-107.000.

Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, to American Tourister, Inc. Soft-sided luggage. 280,865, 10-8-85, Cl. D3-48.000.

Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, to American Tourister, Inc. Soft-sided carry-on luggage. 280,866, 10-8-85, Cl. D3-48.000.

Brio Toy AB: *See—*
Petersson, Nils A. I., 280,919, Cl. D21-143.000.

Bulone, Rego A., to Plastic Dress-Up Co. Riser for a trophy. 280,889, 10-8-85, Cl. D11-164.000.

Burch, Jo E.: *See—*
Sherman, Benjamin; Burch, Jo E.; and Swan, Ralph M., 280,899, Cl. D14-109.000.

Cake, Marcus P.; Falter, Harry W.; Batchelor, Clement W.; and Guarini, Michael A., to Morrison-Knudsen Company, Inc. Combined hydrogen ignitor and housing for wall mounting. 280,926, 10-8-85, Cl. D23-127.000.

Campbell, John S.; Engstrom, John G.; McGarvey, John N.; and Zambelli, Michael P., to AT&T Bell Laboratories. Portable transmitter. 280,896, 10-8-85, Cl. D14-95.000.

Canon Kabushiki Kaisha: *See—*
Nibley, Richard; and Miyagawa, Akira, 280,913, Cl. D18-22.000.

Castle, Rhett. Coaster. 280,916, 10-8-85, Cl. D21-71.000.

Catelli, Pietro, to Artsana S.p.A. Toy xylophone. 280,915, 10-8-85, Cl. D21-64.000.

Catford, Jocelyn D., to Catford, Jocelyn David. Powered golf cart. 280,943, 10-8-85, Cl. D34-15.000.

Catford, Jocelyn David: *See—*
Catford, Jocelyn D., 280,943, Cl. D34-15.000.

Chabanet, Jean P., to Allibert S.A. Wall mounted mirrored cabinet. 280,876, 10-8-85, Cl. D6-559.000.

Chabanet, Jean P., to Allibert S.A. Wall mounted mirrored cabinet. 280,877, 10-8-85, Cl. D6-561.000.

Choi, Jong S., to Gold Star Company, Ltd. Microwave oven. 280,878, 10-8-85, Cl. D7-351.000.

Clairol Incorporated: *See—*
MacGregor, Francis W., 280,934, Cl. D24-36.000.

Conair Corporation: *See—*
Doyle, Edward J., 280,941, Cl. D28-38.000.

Conklin, Marilyn L., to Mattel, Inc. Toy animal figure. 280,920, 10-8-85, Cl. D21-161.000.

Costello, John C.: *See—*
Benigni, Paul E.; Costello, John C.; Gregory, Jack G.; and Morgan, Stuart K., 280,898, Cl. D14-107.000.

Cuesta Systems, Incorporated: *See—*
Dickey, David V., 280,894, Cl. D13-34.000.

Custom Shade and Awning Corporation: *See—*
Fairbanks, Lyman N., 280,874, Cl. D6-575.000.
Fairbanks, Lyman N., 280,875, Cl. D6-575.000.

Dickey, David V., to Cuesta Systems, Incorporated. Power line monitor. 280,894, 10-8-85, Cl. D13-34.000.

Dinsmore, Richard L.; and Maloney, Martin V., to Union Carbide Corporation. Lantern. 280,936, 10-8-85, Cl. D26-48.000.

Doyle, Edward J., to Conair Corporation. Hair setter. 280,941, 10-8-85, Cl. D28-38.000.

Drainage Products, Inc.: *See—*
Farnen, James M., 280,925, Cl. D23-46.000.

Eisen, Leonard, to ZTI Ltd. Convertible seat. 280,870, 10-8-85, Cl. D6-338.000.

Engelhardt, David R., to R. Engelhardt Nominees Pty. Ltd. Spectacle frame. 280,909, 10-8-85, Cl. D16-108.000.

England, William R., III. Machine for sizing, stacking and counting taco shells. 280,886, 10-8-85, Cl. D10-88.000.

Engstrom, John G.: *See—*
Campbell, John S.; Engstrom, John G.; McGarvey, John N.; and Zambelli, Michael P., 280,896, Cl. D14-95.000.

Fago, Anthony. Combined timepiece dial and hands therefor. 280,888, 10-8-85, Cl. D10-124.000.

Fairbanks, Lyman N., to Custom Shade and Awning Corporation. Drapery module unit for doors, windows and the like. 280,874, 10-8-85, Cl. D6-575.000.

Fairbanks, Lyman N., to Custom Shade and Awning Corporation. Drapery module unit for doors, windows and the like. 280,875, 10-8-85, Cl. D6-575.000.

Falter, Harry W.: *See—*
Cake, Marcus P.; Falter, Harry W.; Batchelor, Clement W.; and Guarini, Michael A., 280,926, Cl. D23-127.000.

Farnen, James M., to Drainage Products, Inc. Floor drain. 280,925, 10-8-85, Cl. D23-46.000.

Fong, Daniel D.; Stoner, Eugene A.; and Kim, Young S., to Telecopy, Inc. Housing for a daisy wheel printer. 280,901, 10-8-85, Cl. D14-111.000.

Fujikura, Toshio, to Shachihata Industry Co., Ltd. Stamp. 280,910, 10-8-85, Cl. D18-15.000.

Gamm, Robert J., to Kangaroos U.S.A., Inc. Pocketed shoe. 280,862, 10-8-85, Cl. D2-310.000.

Giraud, Dennis D. B.; and Ivamy, Timothy J. W. Hat. 280,861, 10-8-85, Cl. D2-244.000.

Gold Star Company, Ltd.: *See—*
Choi, Jong S., 280,878, Cl. D7-351.000.

Green, David T., to United States Surgical Corporation. Surgical staple. 280,931, 10-8-85, Cl. D24-26.000.

Green, David T., to United States Surgical Corporation. Surgical staple. 280,932, 10-8-85, Cl. D24-26.000.

Gregory, Jack G.: *See—*
Benigni, Paul E.; Costello, John C.; Gregory, Jack G.; and Morgan, Stuart K., 280,898, Cl. D14-107.000.

Guarini, Michael A.: *See—*
Cake, Marcus P.; Falter, Harry W.; Batchelor, Clement W.; and Guarini, Michael A., 280,926, Cl. D23-127.000.

Hallmark, James C. Ring puzzle toy. 280,918, 10-8-85, Cl. D21-106.000.

Hameyer, Hans: *See—*
Kruse, Friedrich; and Hameyer, Hans, 280,904, Cl. D15-129.000.

Hamilton, Leslie: *See—*
Holewinski, Robert D.; and Hamilton, Leslie, 280,884, Cl. D9-345.000.

Hauville, Jean R. Book holder. 280,869, 10-8-85, Cl. D6-310.000.

Herbert, Steven, to Marley Tile, A.G. Combined stackable tray and/or a corner wall attachable tray. 280,944, 10-8-85, Cl. D34-40.000.

Holewinski, Robert D.; and Hamilton, Leslie, to J & J Dental Products Company. Packaging container. 280,884, 10-8-85, Cl. D9-345.000.

Imada, Michio, to Olympus Optical Company Ltd. Electrophotographic copying machine. 280,906, 10-8-85, Cl. D16-31.000.

Imada, Michio, to Olympus Optical Company Ltd. Electrophotographic copying machine. 280,907, 10-8-85, Cl. D16-31.000.

IMI Cornelius, Limited: *See—*
Schweres, Josef, 280,880, Cl. D7-398.000.

Imran, Mir: *See—*
Speicher, Vernon L.; and Imran, Mir, 280,930, Cl. D24-17.000.

Infante, Daisy. Combined fryer and steamer. 280,879, 10-8-85, Cl. D7-354.000.

Insetta, Diane. Stuffed horse. 280,921, 10-8-85, Cl. D21-165.000.

Interdica S.A.: *See—*
Perrin, Alain-Dominique, 280,885, Cl. D10-32.000.

Ivamy, Timothy J. W.: *See—*
Giraud, Dennis D. B.; and Ivamy, Timothy J. W., 280,861, Cl. D2-244.000.

Iwasaki, Masamitsu; and Yamamoto, Masamitsu, to Uni-Charm Corporation. Air freshener container. 280,927, 10-8-85, Cl. D23-150.000.

J & J Dental Products Company: *See—*
Holewinski, Robert D.; and Hamilton, Leslie, 280,884, Cl. D9-345.000.

Johnson, Thomas B. Tray for artist easel. 280,872, 10-8-85, Cl. D6-511.000.

Kangaroos U.S.A., Inc.: *See—*
Gamm, Robert J., 280,862, Cl. D2-310.000.

Kao, Tonis, to Siemens Aktiengesellschaft. Telephone handset for mobile radio unit. 280,895, 10-8-85, Cl. D14-53.000.

Kim, Young S.: *See—*
Fong, Daniel D.; Stoner, Eugene A.; and Kim, Young S., 280,901, Cl. D14-111.000.

Kosaka, Chihiro. Ribbon Cassette for printer. 280,912, 10-8-85, Cl. D18-22.000.

Kruse, Friedrich; and Hameyer, Hans. Cutting machine for paper, paperboard, brochures or the like. 280,904, 10-8-85, Cl. D15-129.000.

Leath, Lonzie. Beeper holster. 280,863, 10-8-85, Cl. D2-400.000.

Le Marr, Wesley A.: *See—*
Nolles, Anthony; and Le Marr, Wesley A., 280,881, Cl. D8-1.000.

Lystager, Gregers, to 3M A/S. Light unit for curing dental restorative materials. 280,929, 10-8-85, Cl. D24-10.000.

MacGregor, Francis W., to Clairol Incorporated. Foot massager. 280,934, 10-8-85, Cl. D24-36.000.

Maloney, Martin V.: *See—*
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Marley Tile, A.G.: *See—*
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Marshak, Michael S. Front panel for a combined audio mixer and preamplifier or similar article. 280,897, 10-8-85, Cl. D14-96.000.

Maruoka, Hiroshi: *See—*
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, 280,900, Cl. D14-111.000.

Maruyama, Eiki, to Maruyama Industrial Co. Ltd. Dry battery driven liquid pump. 280,902, 10-8-85, Cl. D15-7.000.

Maruyama Industrial Co. Ltd.: *See—*
Maruyama, Eiki, 280,902, Cl. D15-7.000.

Mattel, Inc.: *See—*
Conklin, Marilyn L., 280,920, Cl. D21-161.000.

Matthaei, Charles W. H., to Roman Meal Company. Diet scale. 280,887, 10-8-85, Cl. D10-90.000.

Mazzoni, Alessandro, to Rinaldo Piaggio S.p.A. Aircraft. 280,892, 10-8-85, Cl. D12-332.000.

McGarvey, John N.: *See—*
Campbell, John S.; Engstrom, John G.; McGarvey, John N.; and Zambelli, Michael P., 280,896, Cl. D14-95.000.

McLaughlin, John T. Tray for medicine dispenser. 280,933, 10-8-85, Cl. D24-31.000.

Migliore, John: *See—*
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,865, Cl. D3-48.000.

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Mobil Oil Corporation: *See*—
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Moore, John M.: *See*—
Smith, David B.; Miller, Randolph F.; and Moore, John M., 280,923, Cl. D21-194.000.
Morgan, Stuart K.: *See*—
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Morrison-Knudsen Company, Inc.: *See*—
Cake, Marcus P.; Falter, Harry W.; Batchelor, Clement W.; and Guarini, Michael A., 280,926, Cl. D23-127.000.
Nakatani, Koma, to Velbon International Corporation. Tripod leg lock. 280,908, 10-8-85, Cl. D16-45.000.
Nelson, Denis H., to Warner-Lambert Company. Controller for a dual drug delivery system. 280,928, 10-8-85, Cl. D24-8.000.
Nibley, Richard; and Miyagawa, Akira, to Canon Kabushiki Kaisha. Ink cartridge for printer. 280,913, 10-8-85, Cl. D18-22.000.
Nolles, Anthony; and Le Marr, Wesley A. Solar cell activated turntable. 280,881, 10-8-85, Cl. D8-1.000.
Numata, Teruhisa: *See*—
Sakamoto, Masakazu; Numata, Teruhisa; and Yamamoto, Etsushi, 280,883, Cl. D8-68.000.
Olympus Optical Company Ltd.: *See*—
Imada, Michio, 280,906, Cl. D16-31.000.
Imada, Michio, 280,907, Cl. D16-31.000.
Panafacom Limited: *See*—
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, 280,900, Cl. D14-111.000.
Perrin, Alain-Dominique, to Interdica S.A. Design for a wristwatch. 280,885, 10-8-85, Cl. D10-32.000.
Petersson, Nils A. I., to Brio Toy AB. Rail element for a toy railway. 280,919, 10-8-85, Cl. D21-143.000.
Pitney Bowes Inc.: *See*—
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Plastic Dress-Up Co.: *See*—
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Precor Incorporated: *See*—
Smith, David B.; Miller, Randolph F.; and Moore, John M., 280,923, Cl. D21-194.000.
Provan, Alexander R., to Mobil Oil Corporation. Plastic bag holding rack. 280,871, 10-8-85, Cl. D6-462.000.
Pulichino, John: *See*—
Bomes, Harvey; Pulichino, John; Barber, Jack; and Migliore, John, 280,865, Cl. D3-48.000.
Bomes, Harvey; Pulichino, John; Barber, Jack; and Bell, Max, 280,866, Cl. D3-48.000.
R. Engelhardt Nominees Pty. Ltd.: *See*—
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R. M. Smith, Inc.: *See*—
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Rhoades, Nolan K., to Schwaab Inc. Hand operated type band ink stamp. 280,911, 10-8-85, Cl. D18-15.000.
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Mazzoni, Alessandro, 280,892, Cl. D12-332.000.
Roman Meal Company: *See*—
Matthaei, Charles W. H., 280,887, Cl. D10-90.000.
Russell, Bruce R. Foot scrubber. 280,868, 10-8-85, Cl. D4-118.000.
Ryobi Ltd.: *See*—
Sakamoto, Masakazu; Numata, Teruhisa; and Yamamoto, Etsushi, 280,883, Cl. D8-68.000.
Sakamoto, Masakazu; Numata, Teruhisa; and Yamamoto, Etsushi, to Ryobi Ltd. Portable electric drill. 280,883, 10-8-85, Cl. D8-68.000.
Schwaab Inc.: *See*—
Rhoades, Nolan K., 280,911, Cl. D18-15.000.
Schweres, Josef, to IMI Cornelius, Limited. Beverage dispensing valve. 280,880, 10-8-85, Cl. D7-398.000.
Shachihata Industry Co., Ltd.: *See*—
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Sher, Robert B. Oil lamp. 280,937, 10-8-85, Cl. D26-110.000.
Sher, Robert B. Oil lamp. 280,938, 10-8-85, Cl. D26-110.000.
Sher, Robert B. Oil lamp. 280,939, 10-8-85, Cl. D26-110.000.
Sher, Robert B. Oil lamp. 280,940, 10-8-85, Cl. D26-110.000.
Sherman, Benjamin; Burch, Jo E.; and Swan, Ralph M., to Pitney Bowes Inc. Floppy disk module. 280,899, 10-8-85, Cl. D14-109.000.
Sieder, Stephen M. Upper body exerciser. 280,922, 10-8-85, Cl. D21-191.000.
Siemens Aktiengesellschaft: *See*—
Kao, Tonis, 280,895, Cl. D14-53.000.
Skolnik, Arthur M. Toy vehicle. 280,917, 10-8-85, Cl. D21-80.000.
Smith, David B.; Miller, Randolph F.; and Moore, John M., to Precor Incorporated. Exercise bicycle. 280,923, 10-8-85, Cl. D21-194.000.
Smith, Robert M., to R. M. Smith, Inc. Lawn and garden sprayer. 280,924, 10-8-85, Cl. D23-18.000.
Sony Corporation: *See*—
Ueda, Thomas K., 280,893, Cl. D13-12.000.
Speicher, Vernon L.; and Imran, Mir, to Mirowski, Mieczyslaw. Automatic implantable defibrillator. 280,930, 10-8-85, Cl. D24-17.000.
Spencer Wright Industries, Inc.: *See*—
Aldridge, R. Warren, Jr., 280,905, Cl. D15-130.000.
Stoner, Eugene A.: *See*—
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Swan, Ralph M.: *See*—
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Telecopy, Inc.: *See*—
Fong, Daniel D.; Stoner, Eugene A.; and Kim, Young S., 280,901, Cl. D14-111.000.
Topalian, Joan A. Hair barrette. 280,942, 10-8-85, Cl. D28-42.000.
'totes' incorporated: *See*—
Allen, James H., 280,864, Cl. D3-39.000.
Allen, James H., 280,867, Cl. D3-71.000.
Trudo, Martha J.: *See*—
Trudo, Robert F.; and Trudo, Martha J., 280,890, Cl. D12-112.000.
Trudo, Robert F.; and Trudo, Martha J. Tricycle. 280,890, 10-8-85, Cl. D12-112.000.
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, to Panafacom Limited. Printer. 280,900, 10-8-85, Cl. D14-111.000.
Ueda, Thomas K., to Sony Corporation. Control console. 280,893, 10-8-85, Cl. D13-12.000.
Uni-Charm Corporation: *See*—
Iwasaki, Masamitsu; and Yamamoto, Masamitsu, 280,927, Cl. D23-150.000.
Union Carbide Corporation: *See*—
Dinsmore, Richard L.; and Maloney, Martin V., 280,936, Cl. D26-48.000.
United States Surgical Corporation: *See*—
Green, David T., 280,931, Cl. D24-26.000.
Green, David T., 280,932, Cl. D24-26.000.
Velbon International Corporation: *See*—
Nakatani, Koma, 280,908, Cl. D16-45.000.
Warner-Lambert Company: *See*—
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Whidden, Agnes. Comb holder. 280,873, 10-8-85, Cl. D6-553.000.
Willis, Bobby L.; and Willis, Noemi R. Game target. 280,914, 10-8-85, Cl. D21-5.000.
Willis, Noemi R.: *See*—
Willis, Bobby L.; and Willis, Noemi R., 280,914, Cl. D21-5.000.
Yamamoto, Etsushi: *See*—
Sakamoto, Masakazu; Numata, Teruhisa; and Yamamoto, Etsushi, 280,883, Cl. D8-68.000.
Yamamoto, Masamitsu: *See*—
Iwasaki, Masamitsu; and Yamamoto, Masamitsu, 280,927, Cl. D23-150.000.
Yamamoto, Mitsuru: *See*—
Tsumura, Tomoki; Maruoka, Hiroshi; Asaji, Toshio; and Yamamoto, Mitsuru, 280,900, Cl. D14-111.000.
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ZTI Ltd.: *See*—
Eisen, Leonard, 280,870, Cl. D6-338.000.
3M A/S: *See*—
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LIST OF PLANT PATENTEES

Gonzalez, Richard, to Merkeley, Donald K.; Topinka, Walter A.; and Myrick, Floyd F., part interest to each. Apple tree 'Rico Red'. 5,569, 10-8-85, Cl. 35.000.
Merkeley, Donald K.: *See*—
Gonzalez, Richard, 5,569, Cl. 35.000.
Morrison, Kenneth M. German ivy-plant 'Morrison's Variegated'. 5,571, 10-8-85, Cl. 88.000.
Myrick, Floyd F.: *See*—
Gonzalez, Richard, 5,569, Cl. 35.000.
Petersen, Robert E. Pear tree "San Joaquin". 5,570, 10-8-85, Cl. 36.000.
Topinka, Walter A.: *See*—
Gonzalez, Richard, 5,569, Cl. 35.000.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 8, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

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252 4,545,857
267 4,545,858

CLASS 164

111 4,545,419
150 4,545,420
397 4,545,421
429 4,545,422
481 4,545,423
491 4,545,424

CLASS 165

89 4,545,425
95 4,545,426
104.26 4,545,427
110 4,545,428
169 4,545,429

CLASS 166

59 4,545,430
99 4,545,432
105 4,545,433
183 4,545,431
217 4,545,434
241 4,545,436
248 4,545,435
345 4,545,437

CLASS 172

123 4,545,438
430 4,545,439

CLASS 173

132 4,545,440

CLASS 174

48 B1 3,995,102
52 PE 4,546,209
114 R 4,546,210

CLASS 175

220 4,545,442
258 4,545,443
296 4,545,444
329 4,545,441

CLASS 177

25 4,545,445
108 4,545,446
165 4,545,447
212 4,545,448

CLASS 179

2 A 4,546,211
4,546,213
2 C 4,546,212
81 C 4,546,214
156 R 4,546,215
170.2 4,546,216
185 4,546,217

CLASS 180

53.1 4,545,450
69.3 4,545,449
70.1 4,545,451
88 4,545,452
131 4,545,453
139 4,545,454
197 4,545,455
233 4,545,456
247 4,545,457
255 4,545,458
287 4,545,459

CLASS 182

107 4,545,460

CLASS 184

15.1 4,545,461

CLASS 187

8.41 4,545,462
9 R 4,545,463
29 R 4,545,464

CLASS 188

67 4,545,322
72.3 4,545,465
268 4,545,466

CLASS 191

40 4,546,218

CLASS 192

4 A 4,545,467
51 4,545,469
56 R 4,545,470
67 R 4,545,471
98 4,545,472
106.2 4,545,468
4,545,473

CLASS 194

1 B 4,545,475
1 E 4,545,474

CLASS 198

399 4,545,476
841 4,545,477

CLASS 200

11 R 4,546,219
50 AA 4,546,220
4,546,221
144 B 4,546,222
148 R 4,546,223
153 G 4,546,224

CLASS 201

17 4,545,859
41 4,545,860

CLASS 203

2 4,545,861
10 4,545,862

CLASS 204

1 T 4,545,863
15 4,545,864
23 4,545,865
33 4,545,866
4,545,867
47 4,545,868
4,545,869
54 R 4,545,870
56 R 4,545,871
72 4,545,872
109 4,545,873
129.2 4,545,874
129.4 4,545,875
130 4,545,876
4,545,877
157.1 R 4,545,878
158 R 4,545,879
4,545,880
192 R 4,545,882
192 SP 4,545,881
4,545,883
202 4,545,884
207 4,545,885
252 4,545,886
280 4,545,887
301 4,545,888
406 4,545,889

CLASS 206

5.1 4,545,478
4,545,479
151 4,545,480
219 4,545,481
320 4,545,482
387 4,545,483
425 4,545,484
434 4,545,485
455 4,545,486
508 4,545,487

CLASS 208

8 LE 4,545,890
11 LE 4,545,892
11 R 4,545,891
48 R 4,545,893
311 4,545,894
351 4,545,895

CLASS 209

5 4,545,896
135 4,545,897
166 4,545,898
211 4,545,899
459 4,545,900
535 4,545,488

CLASS 210

96.1 4,545,903
4,545,904
136 4,545,905
138 4,545,906
195.1 4,545,907
198.2 B1 3,855,129
256 4,545,908
618 4,545,909
634 4,545,901
651 4,545,910
734 4,545,902

CLASS 211

11 4,545,489
191 4,545,490

CLASS 215

11 D 4,545,491
227 4,545,492
230 4,545,493
232 4,545,494
235 4,545,495
252 4,545,496
253 4,545,497
260 4,545,498
352 4,545,499

CLASS 219

10.55 F 4,546,225
10.81 4,546,226
69 W 4,546,227
85 R 4,546,228
118 4,546,229
121 EJ 4,546,232
121 LD 4,546,230
121 LN 4,546,231
125.1 4,546,233
137 PS 4,546,234
230 4,546,235
331 4,546,237
365 4,546,236
497 4,546,238
4,546,239

CLASS 220

4 B 4,545,500
318 4,545,501
334 4,545,502
345 4,545,503

CLASS 222

55 4,545,504
65 4,545,505
95 4,545,506
137 4,545,507
153 4,545,508
198 4,545,509
209 4,545,510
367 4,545,511
600 4,545,512
632 4,545,513

CLASS 223

66 4,545,514

CLASS 225

96.5 4,545,515

CLASS 226

20 4,545,516
92 4,545,517
139 4,545,518

CLASS 228

1.1 4,545,519
180.1 4,545,520

CLASS 229

68 R 4,545,521

CLASS 232

43.1 4,545,523
45 4,545,522

CLASS 235

379 4,546,240
380 4,546,241
454 4,546,242

CLASS 236

46 R 4,545,524

CLASS 237

12.3 A 4,545,526

CLASS 238

8 4,545,527

CLASS 239

1 4,545,528
2 S 4,545,529
3 4,545,525
73 4,545,530
150 4,545,531
242 4,545,532
282 4,545,533
286 4,545,534
313 4,545,535
695 4,545,536

CLASS 241

36 4,545,537
73 4,545,538
4,545,539
99 4,545,540
145 4,545,541

CLASS 242

18 A 4,545,542
35.5 A 4,545,551
47.01 4,545,543
55 4,545,544
84.5 R 4,545,545
107 4,545,546
131 4,545,547
156 4,545,548
158.4 R 4,545,549
200 4,545,550

CLASS 244

90 R 4,545,552
134 D 4,545,553

CLASS 248

118.1 4,545,554
280.1 4,545,555
346 4,545,556
516 4,545,557
544 4,545,558
642 4,545,559

CLASS 250

211 J 4,546,244
211 K 4,546,245
211 R 4,546,243
221 4,546,246
223 B 4,546,247
225 4,546,248
227 4,546,249
4,546,250
252.1 4,546,251
4,546,252
288 4,546,253
305 4,546,254
369 4,546,255
372 4,546,256
388 4,546,257
396 R 4,546,258
484.1 4,546,259
491.1 4,546,260
492.1 4,546,261
551 4,546,262
561 4,546,263

CLASS 251

58 4,545,560
129.08 4,545,561
129.20 4,545,562
298 4,545,563
315 4,545,564
331 4,545,565
357 4,545,566

CLASS 252

8.5 A 4,545,911
8.55 D 4,545,912
12.6 4,545,913
70 4,545,916
90 4,545,917
142 4,545,918
174.18 4,545,919
180 4,545,920
299.62 4,545,921
299.63 4,545,922
309 4,545,923
315.7 4,545,924
389 A 4,545,925
511 4,545,914
4,545,926
4,545,927
515 R 4,545,915
518 4,545,928
520 4,545,929
522 R 4,545,930

CLASS 254

344 4,545,567

CLASS 260

112.5 R 4,545,931
4,545,932
119 4,545,933
239 E 4,545,934
245.7 4,545,935
377 4,545,936
396 R 4,545,937
397.1 4,545,938
400 4,545,939
410.7 4,545,941
428 4,545,940
465 D 4,545,942
465.3 4,545,943
545 R 4,545,944

CLASS 261

36 R 4,545,945

CLASS 264

70 4,545,946
150 4,545,947
162 4,545,948
170 4,545,949
210.6 4,545,950
322 4,545,951
328.2 4,545,952
533 4,545,953

CLASS 266

280 4,545,568

CLASS 269

43 4,545,569
52 4,545,570
322 4,545,571
328 4,545,572
4,545,573

CLASS 272

6 4,545,574
97 4,545,575

CLASS 273

25 4,545,576
73 J 4,545,584
113 4,545,577
144 B 4,545,578
162 R 4,545,579
167 R 4,545,580
187 A 4,545,581
238 4,545,582
311 4,545,583

CLASS 277

22 4,545,585
53 4,545,586
80 4,545,587
93 SD 4,545,588

CLASS 280

1.175 4,545,590
5 A 4,545,589
33.99 C 4,545,591
35 4,545,592
242 WC 4,545,593
279 4,545,594
477 4,545,595
509 4,545,596
610 4,545,597
612 4,545,598
642 4,545,599
668 4,545,600
4,545,601
701 4,545,602

CLASS 281

21 A 4,545,603

CLASS 285

12 4,545,604
189 4,545,605

CLASS 290

54 4,546,264

CLASS 292

92 4,545,606
216 4,545,607

CLASS 294

87.1 4,545,608
104 4,545,609

CLASS 296

181 4,545,611
185 4,545,612

CLASS 297

250 4,545,613
284 4,545,614
287 4,545,615
320 4,545,616
340 4,545,617
410 4,545,618
416 4,545,619

CLASS 299

2 4,545,622
4 4,545,620
12 4,545,621

CLASS 303

92 4,545,623

CLASS 305

9 4,545,624

CLASS 307

10 AT 4,546,266
10 CS 4,546,265
116 4,546,267
265 4,546,268
269 4,546,269
353 4,546,270
443 4,546,271
455 4,546,272
468 4,546,273
494 4,546,274
498 4,546,275
578 4,546,276

CLASS 308

5 R 4,545,625
6 C 4,545,626

CLASS 310

13 4,546,277
49 R 4,546,278
59 4,546,279
68 D 4,546,280
83 4,546,281
218 4,546,282
313 R 4,546,283

CLASS 312

235 A 4,545,628
252 4,545,629
285 4,545,630

CLASS 313

25 4,546,284
4,546,285
296 4,546,286
414 4,546,287

CLASS 315

169.4 4,546,288
4,546,289
209 R 4,546,290
382 4,546,291

CLASS 318

116 4,546,292
254 4,546,293
311 4,546,294
372 4,546,295
4,546,296
4,546,297
4,546,298
608 4,546,299
786 4,546,300
798 4,546,301

CLASS 320

25 4,546,302

CLASS 323

210 4,546,303
287 4,546,304
299 4,546,305
308 4,546,306
315 4,546,307
319 4,546,308

CLASS 324

52 4,546,309
4,546,310
58.5 R 4,546,311
61 P 4,546,312
103 P 4,546,313
221 4,546,314
4,546,315
262 4,546,316
301 4,546,317
376 4,546,318
460 4,546,319

CLASS 328

3 4,546,320
142 4,546,321

CLASS 329

50 4,546,322
124 4,546,323

CLASS 330

9 4,546,324
45 4,546,325
129 4,546,326
253 4,546,327

CLASS 331

4 4,546,328
16 4,546,329
17 4,546,330

CLASS 332

19 4,546,331

CLASS 333

139 4,546,332
202 4,546,333
206 4,546,334

CLASS 334

8 4,546,335

CLASS 335

16 4,546,336
4,546,337
229 4,546,338
230 4,546,339

CLASS 336

192 4,546,340

CLASS 337

177 4,546,341

CLASS 339

14 R 4,545,631
18 R 4,545,632
42 4,545,633
97 P 4,545,634
99 R 4,545,635
105 4,545,636
177 E 4,545,637
205 4,545,638
256 R 4,545,639
272 R 4,545,640

CLASS 340

347 AD 4,546,343
347 DD 4,546,342
501 4,546,344
542 4,546,345
608 4,546,346

710 4,546,347
715 4,546,348
731 4,546,349
750 4,546,350
825.34 4,546,352
825.5 4,546,351
966 4,546,353

CLASS 343

17 4,546,354
4,546,355
18 E 4,546,356
702 4,546,357
703 4,546,358
781 R 4,546,359

CLASS 346

1.1 4,546,360
140 R 4,546,361
4,546,362
4,546,363
155 4,546,364
214 4,546,365

CLASS 350

1.1 4,545,641
96.19 4,545,642
96.20 4,545,643
96.21 4,545,644
4,545,645
162.2 4,545,646
331 R 4,545,647
337 4,545,648
356 4,545,649
357 4,545,650
394 4,545,651
432 4,545,652
4,545,653
454 4,545,654
540 4,545,655
552 4,545,656
600 4,545,657

CLASS 351

222 4,545,658

CLASS 352

216 4,545,659

CLASS 354

82 4,545,660
86 4,545,661
118 4,545,662
304 4,545,663
400 4,545,664
402 4,545,665
412 4,545,666
419 4,545,667

CLASS 355

3 DD 4,545,670
3 R 4,545,668
4,545,669
4,545,672
3 SH 4,545,671
4,545,676
52 4,545,673
75 4,545,674
76 4,545,675

CLASS 356

39 4,545,677
124 4,545,678
301 4,545,679
319 4,545,680
325 4,545,681
350 4,545,682
400 4,545,683
4,545,684

CLASS 357

22 4,546,366
23.4 4,546,367
4,546,375
23.7 4,546,376
24 4,546,368
39 4,546,369
43 4,546,370
51 4,546,371
52 4,546,372
67 4,546,373
71 4,546,374

CLASS 358

23 4,546,377
31 4,546,378
36 B1 4,305,091
42 4,546,379
43 4,546,380
78 4,546,381
84 4,546,382
85 4,546,383
107 4,546,384
133 4,546,385
136 4,546,386
186 4,546,387
190 4,546,388
342 4,546,389

CLASS 360

10.3 4,546,390
19.1 4,546,391
30 4,546,392
40 4,546,393
53 4,546,394
77 4,546,395
96.5 4,546,396
99 4,546,397
126 4,546,398
137 4,546,399

CLASS 361

1 4,546,400
91 4,546,401
120 4,546,402
154 4,546,403
331 4,546,404
386 4,546,405
4,546,406
4,546,407
4,546,408
387 4,546,409
4,546,410
4,546,411
395 4,546,412
410 4,546,413
413 4,546,414
433 4,546,415

CLASS 362

84 4,546,416
4,546,417
85 4,546,418
95 4,546,419
268 4,546,420

CLASS 363

21 4,546,421
41 4,546,422
56 4,546,423
87 4,546,424

CLASS 364

153 4,546,425
4,546,426
168 4,546,427
200 4,546,428
4,546,429
4,546,430
4,546,431
4,546,432
4,546,433
300 4,546,434
4,546,435
415 4,546,436
426 4,546,437
444 4,546,439
473 4,546,438
475 4,546,440
482 4,546,441
500 4,546,442
513 4,546,443
550 4,546,444
728 4,546,445
759 4,546,446
767 4,546,447
900 4,546,448
4,546,449
4,546,450
4,546,451

CLASS 365

36 4,546,452
104 4,546,453
200 4,546,454
4,546,455
227 4,546,456
230 4,546,457

CLASS 366

144 4,545,685

CLASS 367

149 4,546,458
155 4,546,459

CLASS 368

63 4,545,686
232 4,545,687
291 4,545,688

CLASS 369

45 4,546,460
50 4,546,461
53 4,546,462
110 4,546,463
280 4,546,464
287 4,546,465

CLASS 370

3 4,546,466
13 4,546,467
54 4,546,468
77 4,546,469
97 4,546,470
123 4,546,471

CLASS 371

15 4,546,472
25 4,546,473
39 4,546,474
49 4,546,475

CLASS 372

6 4,546,476
12 4,546,477
36 4,546,478
45 4,546,479
4,546,480
48 4,546,481
86 4,546,482

CLASS 373

24 4,546,483
27 4,546,484
28 4,546,485

CLASS 374

1 4,545,689
165 4,545,690

CLASS 375

119 4,546,486

CLASS 376

220 4,545,954

CLASS 377

51 4,546,487

CLASS 378

49 4,546,488
103 4,546,489

CLASS 381

56 4,546,490

CLASS 384

458 4,545,691
477 4,545,692
585 4,545,627

CLASS 400

120 4,545,693
124 4,545,694
320 4,545,695

CLASS 401

175 4,545,696

CLASS 403

230 4,545,697
231 4,545,698

CLASS 404

31 4,545,699
75 4,545,700

CLASS 405

153 4,545,701
269 4,545,702
273 4,545,703

CLASS 406

32 4,545,704

CLASS 407

108 4,545,705

CLASS 408

1 BD 4,545,706
111 4,545,707
197 4,545,711

CLASS 409

49 4,545,708
83 4,545,709

CLASS 410

32 4,545,710

CLASS 411

258 4,545,712

CLASS 414

1 4,545,713
24.6 4,545,716
30 4,545,714
36 4,545,715
166 4,545,717
401 4,545,718
416 Re.32,001
523 4,545,719
723 4,545,720
724 4,545,721
730 4,545,722
4,545,723
745 4,545,724

CLASS 415

26 4,545,726
180 4,545,725
206 4,545,727

CLASS 416

11 4,545,728
132 B 4,545,729
138 4,545,733
146 A 4,545,734

CLASS 417

53 4,545,737
4,545,738
63 4,545,736
68 4,545,730
86 4,545,731
152 4,545,739
273 4,545,732
307 4,545,735
317 4,545,740
365 4,545,741
366 4,545,742
372 4,545,743
475 4,545,744
477 4,545,745

CLASS 418

55 4,545,746
4,545,747
61 B 4,545,748
173 4,545,749

CLASS 419

38 4,545,955

CLASS 422

28 4,545,956
81 4,545,957
102 4,545,958
142 4,545,959
186.12 4,545,960
193 4,545,961

CLASS 423

20 4,545,962
26 4,545,963
138 4,545,964
229 4,545,965
245 4,545,966
263 4,545,967
290 4,545,968
328 4,545,969
331 4,545,970
359 4,545,971
463 4,545,972
512 R 4,545,973
594 4,545,974
636 4,545,975
650 4,545,976

CLASS 424

10 4,545,977
4,545,978
52 4,545,979
60 4,545,980
61 4,545,981
62 4,545,982
63 4,545,983
70 4,545,984
85 4,545,985
4,545,986
89 4,545,987
94 4,545,988
154 4,545,989

CLASS 425

32 4,545,750
72 R 4,545,751
112 4,545,752
350 4,545,753
419 4,545,754
420 4,545,755
590 4,545,756
593 4,545,757

CLASS 426

94 4,545,997
321 B1 3,952,112
424 4,545,998
548 4,545,999
4,546,000
549 4,546,001
576 4,546,002
581 4,546,003
656 4,546,004
660 4,546,005

CLASS 427

2 4,546,006
8 4,546,007
38 4,546,008
39 4,546,009
96 4,546,010
179 4,546,011
213 4,546,012
220 4,546,013
239 4,546,014
247 4,546,015
255.3 4,546,016
387 4,546,017
407.2 4,546,018

CLASS 428

13 4,546,019
16 4,546,020
31 4,546,021
4,546,022
36 4,546,023
44 4,546,024
47 4,546,025
91 4,546,026
109 4,546,027
116 4,546,028
141 4,546,029
220 4,546,030
222 4,546,031
223 4,546,032
290 4,546,033
315.9 4,546,035
318.4 4,546,034
323 4,546,036
4,546,037
4,546,038
357 4,546,039
370 4,546,040
372 4,546,041
378 4,546,042
397 4,546,043
413 4,546,044
424.6 4,546,045
460 4,546,046
565 4,546,047
608 4,546,048
621 4,546,049
630 4,546,050
653 4,546,051
679 4,546,052

CLASS 429

57 4,546,053
101 4,546,054
103 4,546,055
149 4,546,056
218 4,546,057
223 4,546,058

CLASS 430

59 4,546,059
108 4,546,060
207 4,546,061
215 4,546,062
269 4,546,063
270 4,546,064
313 4,546,065
314 4,546,066
325 4,546,067
375 4,546,068
390 4,546,069
393 4,546,070
428 4,546,071
449 4,546,072
543 4,546,073
573 4,546,074
617 4,546,075

CLASS 431

208 4,545,758
344 4,545,759

CLASS 432

5 4,545,761
59 4,545,762
78 4,545,763
115 4,545,764

CLASS 433

18 4,545,760

CLASS 434

43 4,545,765
218 4,545,766
224 4,545,767
304 4,545,768

CLASS 435

24 4,546,076
26 4,546,077
52 4,546,078
71 4,546,079
148 4,546,080
161 4,546,081
172.3 4,546,082
240 4,546,083
253 4,546,084
284 4,546,085
287 4,546,086

CLASS 436

5 4,546,087
178 4,546,088

CLASS 440

61 4,545,769
4,545,770
89 4,545,771

CLASS 441

74 4,545,772
114 4,545,773

CLASS 445

22 4,545,774

CLASS 446

299 4,545,775
443 4,545,776
457 4,545,777

CLASS 474

153 4,545,778
240 4,545,779

CLASS 493

11 4,545,780
220 4,545,781
425 4,545,782

CLASS 501

96 4,546,089

CLASS 502

69 4,546,090
84 4,546,091
105 4,546,092
324 4,546,093
402 4,546,094

CLASS 514

23 4,546,095
25 4,546,096
26 4,546,097
100 4,545,991
161 4,545,992
177 4,546,098
212 4,546,099
231 4,546,100
253 4,546,101
259 4,546,102
282 4,546,103
293 4,546,104
334 4,546,105
345 4,546,106
411 4,546,107
456 4,545,993
464 4,546,108
493 4,546,109
514 4,545,994
523 4,545,995
529 4,546,110
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D6—	310	280,869
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	462	280,871
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	169	280,891
	332	280,892
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U.S. GOVERNMENT PRINTING OFFICE : O—1985

CHANGE OF ADDRESS FORM

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COMPANY NAME OR ADDITIONAL ADDRESS LINE

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